

# California County Asthma Hospitalization Chart Book



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## AUTHORS AND ACKNOWLEDGEMENTS

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## HOW TO USE THIS REPORT

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This report presents hospitalization rates for asthma in California counties for 1995 through 1997. The report is intended to provide information to counties on progress toward achieving the national *Healthy People 2000* goal of reduced asthma hospitalizations. Rates are shown separately by race/ethnicity and for children to help county health officials identify populations most at risk for severe asthma morbidity. Individual county data are presented in tables as well as on maps and graphs.

Hospitalization rates are not indicators of asthma prevalence. Asthma is a chronic disease which can present on a spectrum of severity. Hospitalization rates measure an infrequent, severe outcome of this disease.

Similar information by zip code may be provided to counties. Please contact the California Department of Health Services, Environmental Health Investigations Branch at 510-622-4500 for more information.



# I. INTRODUCTION

Asthma is a disease of airway inflammation that makes breathing difficult. Symptoms include shortness of breath, chest tightness, wheezing, and coughing. National asthma mortality and self-reported prevalence increased during the last two decades.<sup>1</sup> The prevalence of this disease increased 75% from 1980 to 1994 in the United States.<sup>1</sup> Despite this increase in prevalence, nationwide asthma hospital admissions did not change significantly between 1979 and 1994.<sup>1</sup> Large differences in hospitalization rates exist between racial groups, with Blacks having rates several times higher than Whites.<sup>1</sup> Regional differences also exist in the U.S. with the western states having lower asthma hospitalization rates than the northeastern area of the country.<sup>2</sup>

Approximately 2.2 million Californians suffer from asthma.<sup>3</sup> Every year about 40,000 Californians are hospitalized because of asthma. Young people in particular suffer greatly from this illness. Asthma is the leading cause of hospital admissions in young children in California.<sup>4</sup>

The U.S. Department of Health and Human Services' *Healthy People 2000: National Health Promotion and Disease Prevention Objectives* established a goal in the area of environmental health to "reduce asthma morbidity, as measured by a reduction in hospitalizations."<sup>5</sup> Blacks, other non-Whites, and children were identified as special target populations.

This report examines county variations in asthma hospitalization rates in California. Information on progress toward meeting the *Healthy People 2000* goals of reduced asthma hospitalizations is also presented. *Healthy People 2010*<sup>6</sup> also includes reduction in asthma hospitalization as an objective under respiratory disease.

# II. METHODS

## Asthma Hospitalization Rates

Data for hospital discharges from 1995 through 1997 were obtained from computerized records of all hospital discharges in California, except from federal facilities.<sup>7</sup> This database contains demographic information on each patient discharged, including age, sex, race, and zip code of residence. Additional data elements include principal diagnosis, other diagnoses, length of stay, principal medical procedure performed, disposition of patient, expected source of payment, and total charges. All discharges with asthma as the primary diagnosis were selected, based on the ninth revision of the International Classification of Diseases (ICD-9), code 493.<sup>8</sup> Rates were calculated for the three years combined to provide a more stable estimate for the more sparsely populated counties.

Rates were calculated using yearly population estimates by age, race, sex, and county.<sup>9</sup> Four race/ethnicity groups were used: Non-Hispanic White, Black, Hispanic, and Asian/Pacific Islander. Individuals with a race/ethnicity of 'other' or 'unknown' were excluded from race specific analysis but included in the overall estimates. The overall rate is influenced by the racial composition of the county's residents. The zip code of each patient was used to assign county of residence. County rates were age-adjusted using the direct method to the 1990 California population (Appendix A).<sup>10</sup> Eighteen age groups were used: 0 – 4 years, and 5 – 84 in five year age-groups, and over 84 years. The 95% confidence intervals were calculated for age-adjusted rates using a square root transformation assuming a Poisson distribution.<sup>11</sup>

For some sparsely-populated counties and some race/ethnic groups, rates were based on small numbers and were very imprecise. These rates were omitted from tables when the number of discharges for a county or group was less than 20.

## Length of Stay, Costs, and Insurance

Three additional variables were examined to give a larger picture of the hospitalization data. These variables were 'length of stay' — the time spent in the hospital for each individual hospitalization

given in days; 'total charges' — the total charges associated with each hospitalization; and 'expected principal source of payment' — the source from which the hospital expects to receive payment for charges incurred from the hospitalization. It is important to note for the total charges estimates that not all hospitals report charges to the database. Kaiser Permanente and Shriners Hospitals are exempt from reporting charges. The expected source of payment as given in the database is divided into fourteen categories. For the purposes of this analysis they have been grouped as follows: Medicare = Medicare (even if Health Maintenance Organization (HMO) or Preferred Provider Organization (PPO)); Medi-Cal = Medi-Cal (even if HMO or PPO); Private Insurance = private insurance company, HMO, PPO, Blue Cross/Blue Shield; Self Pay; and Other = worker's compensation, county indigent program, CHAMPUS/CHAMPVA/VA, other governmental, charity care, no charge, and other non-governmental sources.

### III. RESULTS

#### Asthma Hospitalization Rates

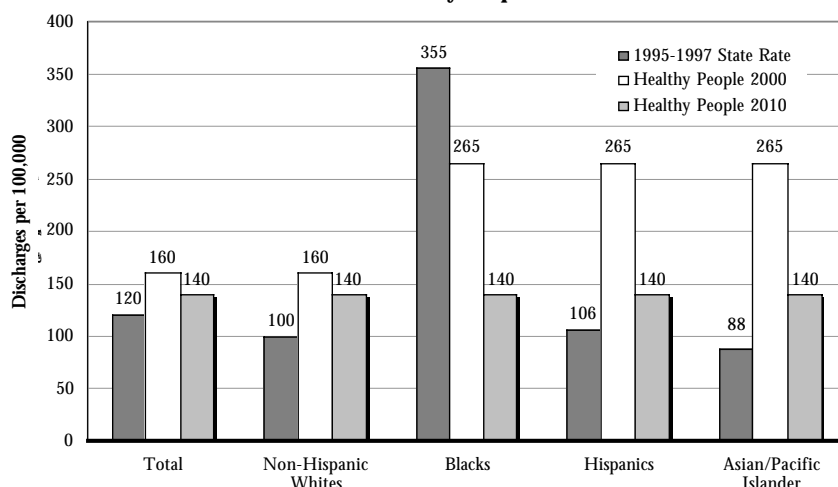
The overall hospital discharge rate in California from 1995 through 1997 was 120 per 100,000 (Table 1). This rate is below the established *Healthy People 2000* objective. The overall hospital discharge rate for Blacks was 355 per 100,000 which is well above the established target of 265 per 100,000. The rates for the other non-White groups were below the established goal. The overall hospital discharge rate for children, 216 per 100,000, was just under the established target of 225 per 100,000. The rate for Black children, however, was very high, 678 per 100,000 children. Chart 1 below presents graphically the state rates in comparison to the *Healthy People 2000* goals and the goal for the *Healthy People 2010* (one goal for all race/ethnicity groups, adults and children of 140 hospitalizations per 100,000 population).

Table 1 presents age-adjusted asthma hospitalization rates by county and race/ethnicity for all ages combined. County-specific asthma hospitalization rates for children, ages 0–14, are presented in Table 2 separately because children are a population of specific concern for asthma morbidity. Figures 1 through 10 illustrate the same data with counties ranked from lowest to highest by hospitalization rates. The 95% confidence bars, the state rates, and the *Healthy People 2000* goals are presented as well in these. Table 3 gives the counts of asthma hospitalizations by county and race/ethnicity for all ages and separately for children.

Maps 1 and 2 show counties shaded according to whether the asthma hospitalization rate is higher or lower than the state rate for all ages and separately for children. The map shading also indicates the magnitude of the difference from the state rate. Maps 3-10 show asthma hospitalization rates by county for the four race/ethnicity groups.

Many counties had race-specific rates that were elevated (statistically significant) compared to the state rates. San Bernardino and San Francisco County had significantly elevated rates for all race groups examined and in the analysis with all ages combined. Alameda, Fresno, Imperial, Los Angeles, San Joaquin, and Sutter Counties had at least two of the race/ethnicity groups with significantly

**Chart 1: Age-Adjusted Asthma Hospitalization Rates in California, 1995-1997, and the Healthy People 2000 and 2010 Goals**





higher rates of asthma-related hospitalization compared to the state rate for all ages. Imperial County had among the highest county-specific rates of asthma hospitalizations for many of the groups examined. The highest county rate for non-Hispanics Whites was in Trinity County. For children (0–14 years), Alameda, Fresno and Imperial had rates that were significantly higher than the state rate in all race groups calculated.

There were also many counties that had lower (statistically significant) rates than the state asthma-related hospitalization rate. For the analysis with all ages combined, Orange and Santa Barbara had lower rates than California in all race/ethnicity groups examined, and, for the analysis of children separately, Orange and Santa Clara had lower rates than California in all race/ethnicity groups examined. Marin, Monterey, San Diego, San Luis Obispo, San Mateo, Santa Clara, and Sonoma, also had lower rates in most groups examined.

Figure 11 presents California hospitalization rates by sex for boys and girls aged 0–14 years by race/ethnicity. The rates for boys are uniformly higher than girls by about 50%. Again, Blacks have a much higher rate than any of the other race/ethnicity groups, with Black girls having a high rate of 501 (95% CI: 486–516) and Black boys having an substantially high rate of 850 (95% CI: 831–869) hospitalizations per 100,000 population.

The same type of analysis was performed for the years 1995–1997 for children (0–14) in four age groups (Figure 12). No time trend can be inferred from this data, however a clear inverse relationship between age and rate of hospital admission can be seen, with children less than one year old having a rate of hospital admission three times that of the 10–14 year olds.

### **Length of Stay, Costs, and Insurance**

The results of the analysis that examined length of stay is presented in Figures 13–15. The mean number of days spent in the hospital for asthma was 3.5 days. There was no significant difference in the length of stay among race/ethnic groups, however adults admitted with a primary diagnosis of asthma have a longer hospital stay than children.

The mean charges incurred from an asthma hospitalization was approximately \$10,000 for adults and \$6,300 for children. Again, there was no significant difference among the race/ethnic groups either in adults or in children.

Medi-Cal, Medicare and private insurance accounted for most of expected payments for the hospital stay for all ages. Non-Hispanic Whites had proportionately more private insurance than any other group. Hispanics had the highest proportion reporting an expected payment of Medi-Cal, followed closely by Blacks. About half as many Hispanics and Blacks reported having Medicare compared to Non-Hispanic Whites and Asian/Pacific Islanders. The values for children separately are very similar (the exception was Medicare which was so rare and was grouped with ‘other’).

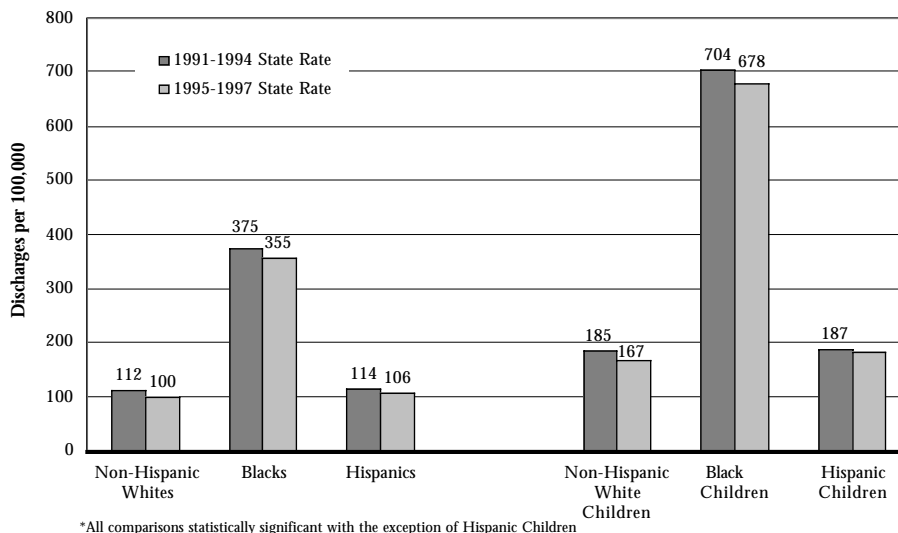
## **IV. DISCUSSION**

Overall the rates for California asthma hospitalizations decreased compared to the previously published figures for 1991–1994<sup>12</sup> (see Chart 2 on page 4). California rates as a whole are well under the *Healthy People 2000* goals, with the exception of the Black racial/ethnic group. Some counties however have rates that are much higher than both the state rate and the *Healthy People 2000* goals. Blacks continue to have significantly elevated rates as compared to the other racial/ethnic groups examined.

The costs associated with asthma hospitalizations do not seem to be influenced by racial/ethnic group but do seem to be affected by age. For children, the total charges incurred per hospital stay is approximately two-thirds that of adults. This correlates with the fewer total days spent per admission in the hospital per admission by children.

It is meaningful to consider limitations of the data that might have influenced the analysis. Incorrect diagnosis and inconsistent coding could have affected the overall estimates, and misclassification of race/ethnicity groups could have altered race-specific rates. Also, in 1995, the coding of ethnicity in the hospitalizations database changed so that race and Hispanic

**Chart 2: Age-Adjusted Asthma Hospitalization Rate,\*  
1991-1994 Compared to 1995-1997.**



ethnicity were two separate fields. This introduced the possibility of misclassification in the race groups. Moreover, errors can occur when assigning county of residence based solely on zip code because there are locations where a zip code covers more than one county. For example, the zip code 95236 includes parts of both San Joaquin and Calaveras counties. This overlap occurs in over 200 other zip codes in the state.<sup>5</sup> Any differences in rates could be explained wholly or in part by factors that would have influenced the numerator such as changes in outpatient care, hospital admission practices, and health care financing. Further, the population estimates used in the denominator for all rates calculated are not always accurate. All rates were based on hospital admissions, not on individuals admitted to the hospital and therefore, individuals with more than one hospitalization are counted more than once.

Although hospital discharge rates are not indicators of asthma prevalence, these data provide a useful source of information for surveillance of asthma. Hospitalizations occur only in the most severe cases of asthma but account for a large amount of the economic burden placed on the state by asthma morbidity. In 1997, 39,708 adults and 16,705 children were admitted to the hospital in California for asthma. The total cost of these hospitalizations was approximately \$350,000,000, with almost \$130,000,000 of this amount paid for by Medi-Cal. This type of statewide surveillance of asthma-related hospitalizations can help target specific populations that may be at greater risk of asthma morbidity, and suggest strategies to reduce asthma costs.

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## **APPENDIX I. CALIFORNIA 1990 POPULATION**

California Department of Finance Population Estimates for California in 1990, used for age-adjusting rates.

<b>Age Group</b>	<b>Population Estimate</b>
0-4	2,492,592
5-9	2,225,944
10-14	1,980,538
15-19	2,101,194
20-24	2,551,345
25-29	2,878,848
30-34	2,841,040
35-39	2,496,451
40-44	2,140,085
45-49	1,610,757
50-54	1,281,244
55-59	1,135,839
60-64	1,105,675
65-69	1,055,945
70-74	804,729
75-79	603,104
80-84	376,629
85+	<u>294,044</u>
<b>TOTAL</b>	<b>29,976,003</b>

## APPENDIX II. TABLES

**Table 1: Age-adjusted\* Asthma Hospitalization Rates\*\* in California by County and Race/Ethnicity for All Ages, 1995-1997.**

County	TOTAL		NON-HISPANIC WHITE		BLACK		HISPANIC		ASIAN/PACIFIC ISLANDER	
	Rate	CI	Rate	CI	Rate	CI	Rate	CI	Rate	CI
<b>CALIFORNIA</b>	<b>120</b>	<b>(119 -120)</b>	<b>100</b>	<b>(99 -101)</b>	<b>355</b>	<b>(350 -359)</b>	<b>106</b>	<b>(105 -107)</b>	<b>88</b>	<b>(86 -89)</b>
Alameda	172	(168 -176)	106	(101 -111)	412	(398 -428)	109	(101 -117)	103	(96 -110)
Alpine	108	(26 -248)	.	.	.	.	.	.	.	.
Amador	96	(76 -119)	107	(83 -133)	.	.	.	.	.	.
Butte	104	(96 -113)	104	(95 -114)	.	.	80	(56 -108)	85	(48 -132)
Calaveras	77	(60 -96)	80	(62 -101)	.	.	.	.	.	.
Colusa	71	(50 -95)	92	(59 -131)	.	.	.	.	.	.
Contra Costa	120	(116 -124)	89	(85 -94)	350	(327 -375)	103	(92 -114)	97	(86 -109)
Del Norte	88	(69 -110)	87	(64 -112)	.	.	.	.	.	.
El Dorado	91	(82 -101)	93	(83 -104)	.	.	.	.	.	.
Fresno	139	(132 -145)	95	(89 -101)	508	(465 -552)	127	(119 -135)	82	(69 -95)
Glenn	96	(75 -119)	111	(84 -142)	.	.	.	.	.	.
Humboldt	102	(92 -112)	105	(93 -116)	.	.	.	.	.	.
Imperial	207	(193 -221)	262	(230 -296)	781	(626 -954)	179	(163 -195)	.	.
Inyo	88	(63 -117)	99	(68 -137)	.	.	.	.	.	.
Kern	107	(102 -112)	126	(119 -133)	293	(260 -327)	60	(54 -68)	73	(52 -97)
Kings	155	(142 -169)	129	(113 -147)	230	(171 -298)	186	(161 -212)	.	.
Lake	77	(63 -93)	77	(62 -95)	.	.	.	.	.	.
Lassen	57	(42 -73)	70	(51 -91)	.	.	.	.	.	.
Los Angeles	135	(134 -136)	109	(107 -111)	358	(351 -365)	118	(116 -120)	87	(84 -90)
Madera	99	(88 -111)	82	(69 -96)	387	(276 -515)	96	(78 -116)	.	.
Marin	55	(50 -61)	55	(49 -62)	131	(87 -183)	27	(16 -41)	.	.
Mariposa	154	(115 -198)	157	(118 -201)	.	.	.	.	.	.
Mendocino	113	(100 -127)	115	(100 -131)	.	.	68	(40 -104)	.	.
Merced	109	(100 -117)	107	(95 -119)	369	(296 -449)	103	(88 -118)	73	(50 -100)
Modoc	75	(46 -113)	78	(45 -120)	.	.	.	.	.	.
Mono	56	(32 -86)	.	.	.	.	.	.	.	.
Monterey	88	(82 -94)	85	(77 -94)	132	(103 -164)	81	(71 -90)	92	(72 -114)
Napa	64	(56 -73)	63	(53 -73)	.	.	59	(40 -81)	.	.
Nevada	51	(42 -61)	52	(43 -63)	.	.	.	.	.	.
Orange	82	(80 -84)	87	(85 -90)	224	(197 -252)	74	(70 -78)	60	(56 -66)
Placer	68	(61 -75)	68	(61 -75)	.	.	47	(30 -67)	.	.
Plumas	197	(160 -239)	187	(148 -231)	.	.	.	.	.	.
Riverside	132	(128 -135)	123	(119 -128)	377	(352 -404)	115	(109 -122)	61	(49 -74)
Sacramento	119	(115 -123)	99	(94 -103)	288	(269 -307)	93	(84 -103)	98	(88 -109)
San Benito	64	(51 -79)	65	(47 -87)	.	.	73	(53 -98)	.	.
San Bernardino	179	(175 -183)	154	(149 -159)	474	(451 -497)	152	(145 -159)	109	(95 -123)
San Diego	94	(92 -96)	75	(73 -78)	279	(263 -295)	88	(84 -93)	102	(94 -109)
San Francisco	160	(154 -165)	128	(119 -137)	463	(435 -492)	134	(122 -147)	113	(106 -121)
San Joaquin	124	(119 -130)	119	(112 -127)	445	(400 -492)	84	(75 -94)	76	(64 -88)
San Luis Obispo	77	(70 -84)	76	(68 -83)	244	(160 -346)	60	(45 -78)	.	.
San Mateo	85	(81 -89)	75	(70 -81)	195	(169 -224)	79	(71 -88)	85	(76 -95)
Santa Barbara	61	(56 -65)	58	(52 -64)	167	(123 -218)	61	(53 -70)	50	(33 -71)

**Table 1: Age-adjusted\* Asthma Hospitalization Rates\*\* in California by County and Race/Ethnicity for All Ages, 1995-1997, continued.**

County	TOTAL		NON-HISPANIC WHITE		BLACK		HISPANIC		ASIAN/PACIFIC ISLANDER	
	Rate	CI	Rate	CI	Rate	CI	Rate	CI	Rate	CI
Santa Clara	86	(83 -88)	77	(73 -80)	210	(187 -234)	84	(79 -90)	88	(82 -94)
Santa Cruz	79	(73 -86)	86	(77 -94)	.	.	70	(57 -84)	.	.
Shasta	92	(83 -101)	96	(87 -106)	.	.	.	.	.	.
Sierra	34	(5 -89)	.	.	.	.	.	.	.	.
Siskiyou	88	(72 -106)	98	(79 -118)	.	.	.	.	.	.
Solano	118	(111 -124)	101	(93 -109)	235	(210 -261)	70	(57 -84)	109	(93 -127)
Sonoma	75	(70 -80)	77	(71 -82)	213	(150 -287)	48	(37 -60)	.	.
Stanislaus	97	(91 -102)	100	(93 -107)	318	(248 -398)	70	(60 -80)	63	(45 -84)
Sutter	126	(112 -142)	122	(105 -141)	614	(382 902)	55	(34 -82)	108	(69 -156)
Tehama	100	(84 -117)	108	(90 -128)	.	.	.	.	.	.
Trinity	391	(327 -462)	423	(352 -501)	.	.	.	.	.	.
Tulare	105	(99 -111)	115	(105 -124)	387	(290 -497)	89	(80 -99)	72	(50 -99)
Tuolumne	64	(51 -78)	67	(53 -84)	.	.	.	.	.	.
Ventura	100	(96 -104)	89	(84 -94)	285	(238 -337)	110	(101 -119)	70	(56 -86)
Yolo	89	(80 -98)	84	(74 -95)	295	(194 -418)	94	(75 -115)	.	.
Yuba	128	(112 -146)	143	(123 -164)	.	.	.	.	.	.

CI = 95% Confidence Interval

\* Age-adjusted to the 1990 California population.

\*\* Hospitalizations per 100,000 person-years. Rate not presented if the number of cases per group was less than twenty.

**Table 2: Age-adjusted\* Asthma Hospitalization Rates\*\* in California Children (Ages 0-14 years) by County and Race/Ethnicity, 1995-1997.**

County	TOTAL		NON-HISPANIC WHITE		BLACK		HISPANIC		ASIAN/PACIFIC ISLANDER	
	Rate	CI	Rate	CI	Rate	CI	Rate	CI	Rate	CI
<b>CALIFORNIA</b>	<b>216</b>	<b>(214 -218)</b>	<b>167</b>	<b>(164 -169)</b>	<b>678</b>	<b>(666 -690)</b>	<b>183</b>	<b>(180 -186)</b>	<b>141</b>	<b>(137 -146)</b>
Alameda	384	(372 -397)	186	(171 -200)	935	(891 -979)	265	(242 -288)	202	(182 -223)
Alpine	.	. .	.	. .	.	. .	.	. .	.	. .
Amador	180	(118 -254)	196	(126 -280)	.	. .	.	. .	.	. .
Butte	192	(168 -217)	184	(157 -213)	.	. .	158	(101 -226)	.	. .
Calaveras	147	(99 -205)	160	(106 -223)	.	. .	.	. .	.	. .
Colusa	122	(71 -188)	.	. .	.	. .	.	. .	.	. .
Contra Costa	198	(186 -209)	132	(120 -145)	530	(476 -587)	165	(142 -190)	146	(119 -175)
Del Norte	131	(82 -191)	.	. .	.	. .	.	. .	.	. .
El Dorado	115	(94 -138)	121	(98 -148)	.	. .	.	. .	.	. .
Fresno	308	(293 -324)	188	(170 -207)	1165	(1057 -1279)	289	(270 -309)	177	(150 -205)
Glenn	81	(47 -125)	.	. .	.	. .	.	. .	.	. .
Humboldt	141	(116 -169)	149	(120 -181)	.	. .	.	. .	.	. .
Imperial	556	(514 -600)	704	(585 -834)	2610	(1888 -3448)	480	(437 -526)	.	. .
Inyo	108	(55 -179)	.	. .	.	. .	.	. .	.	. .
Kern	176	(165 -188)	255	(235 -275)	553	(475 -638)	45	(37 -55)	.	. .
Kings	240	(209 -272)	158	(122 -199)	569	(382 -793)	291	(242 -345)	.	. .
Lake	75	(48 -107)	.	. .	.	. .	.	. .	.	. .
Lassen	88	(48 -140)	.	. .	.	. .	.	. .	.	. .
Los Angeles	242	(239 -246)	186	(180 -193)	664	(645 -683)	196	(192 -201)	148	(139 -157)
Madera	189	(160 -220)	147	(109 -190)	.	. .	197	(157 -241)	.	. .
Marin	114	(96 -133)	111	(90 -133)	.	. .	89	(50 -138)	.	. .
Mariposa	145	(75 -237)	.	. .	.	. .	.	. .	.	. .
Mendocino	159	(127 -194)	146	(110 -187)	.	. .	.	. .	.	. .
Merced	190	(170 -211)	225	(190 -262)	781	(590 -997)	147	(121 -176)	.	. .
Modoc	99	(34 -198)	.	. .	.	. .	.	. .	.	. .
Mono	158	(77 -268)	.	. .	.	. .	.	. .	.	. .
Monterey	136	(123 -150)	125	(104 -148)	191	(125 -272)	120	(103 -138)	196	(136 -268)
Napa	113	(90 -139)	118	(88 -152)	.	. .	106	(66 -155)	.	. .
Nevada	70	(48 -97)	76	(52 -106)	.	. .	.	. .	.	. .
Orange	131	(126 -136)	132	(125 -140)	366	(306 -431)	127	(119 -136)	83	(72 -96)
Placer	98	(82 -115)	92	(75 -110)	.	. .	79	(42 -128)	.	. .
Plumas	187	(112 -281)	.	. .	.	. .	.	. .	.	. .
Riverside	253	(244 -263)	227	(214 -240)	857	(786 -931)	.	. .	74	(51 -102)
Sacramento	214	(204 -224)	166	(154 -178)	522	(478 -568)	171	(150 -194)	157	(134 -182)
San Benito	106	(74 -144)	.	. .	.	. .	.	. .	.	. .
San Bernardino	348	(338 -358)	275	(262 -288)	1004	(950 -1060)	274	(260 -289)	176	(144 -211)
San Diego	163	(157 -169)	117	(110 -124)	483	(448 -520)	141	(132 -150)	152	(134 -171)
San Francisco	317	(299 -336)	221	(193 -252)	664	(594 -737)	351	(310 -393)	213	(189 -239)
San Joaquin	203	(189 -217)	193	(173 -214)	757	(653 -869)	143	(123 -165)	118	(94 -144)
San Luis Obispo	135	(116 -156)	120	(99 -144)	.	. .	127	(88 -173)	.	. .
San Mateo	167	(155 -180)	138	(122 -156)	308	(239 -385)	168	(146 -191)	148	(124 -173)
Santa Barbara	91	(79 -103)	92	(75 -110)	400	(262 -566)	77	(62 -94)	.	. .
Santa Clara	134	(127 -141)	119	(109 -130)	352	(297 -412)	118	(107 -130)	112	(99 -125)
Santa Cruz	128	(111 -146)	131	(108 -156)	.	. .	132	(105 -163)	.	. .



**Table 2: Age-adjusted\* Asthma Hospitalization Rates\*\* in California Children (Ages 0-14 years) by County and Race/Ethnicity, 1995-1997, continued.**

County	TOTAL		NON-HISPANIC WHITE		BLACK		HISPANIC		ASIAN/PACIFIC ISLANDER	
	Rate	CI	Rate	CI	Rate	CI	Rate	CI	Rate	CI
Shasta	137	(115 -160)	147	(123 -174)	.	.	.	.	.	.
Sierra	120	(7 -373)	.	.	.	.	.	.	.	.
Siskiyou	144	(100 -195)	164	(113 -226)	.	.	.	.	.	.
Solano	185	(169 -201)	131	(113 -150)	426	(364 -492)	137	(106 -172)	152	(116 -192)
Sonoma	92	(81 -104)	95	(82 -110)	.	.	52	(34 -74)	.	.
Stanislaus	145	(132 -158)	141	(124 -159)	663	(485 -868)	112	(93 -133)	.	.
Sutter	184	(150 -222)	184	(141 -234)	.	.	.	.	.	.
Tehama	100	(69 -136)	106	(70 -150)	.	.	.	.	.	.
Trinity	120	(54 -214)	.	.	.	.	.	.	.	.
Tulare	150	(136 -164)	171	(148 -196)	.	.	128	(111 -146)	.	.
Tuolumne	114	(76 -159)	117	(77 -166)	.	.	.	.	.	.
Ventura	186	(175 -198)	144	(130 -159)	744	(591 -913)	204	(184 -224)	117	(81 -161)
Yolo	106	(87 -127)	103	(78 -132)	.	.	113	(79 -153)	.	.
Yuba	180	(145 -218)	202	(157 -254)	.	.	.	.	.	.

CI = 95% Confidence Interval

\* Age-adjusted to the 1990 California population.

\*\* Hospitalizations per 100,000 person-years. Rate not presented if the number of cases per group was less than twenty.

**Table 3: Number Asthma Hospitalizations by County and Race/Ethnicity for All Ages and for Children (0-14 years), 1995–1997.**

County	TOTAL		NON-HISPANIC WHITE		BLACK		HISPANIC		ASIAN/PACIFIC ISLANDER	
	All	Children	All	Children	All	Children	All	Children	All	Children
<b>CALIFORNIA</b>	<b>119960</b>	<b>50292</b>	<b>51291</b>	<b>15225</b>	<b>25341</b>	<b>12020</b>	<b>31058</b>	<b>17826</b>	<b>8809</b>	<b>3498</b>
Alameda	7109	3452	2035	615	3163	1710	807	533	749	359
Alpine	†	.	†	.	.	.	.	.	.	.
Amador	81	22	77	21	†	.	†	†	.	.
Butte	630	214	535	156	18	9	41	24	22	17
Calaveras	84	28	79	27	†	†	.	.	.	.
Colusa	41	16	30	9	.	.	9	7	†	.
Contra Costa	3219	1105	1578	413	896	350	358	179	266	99
Del Norte	76	23	61	19	†	†	†	†	†	†
El Dorado	402	100	368	88	†	†	17	10	.	.
Fresno	3438	1963	988	384	657	422	1312	895	220	153
Glenn	72	16	59	11	.	.	7	†	†	.
Humboldt	371	103	324	86	5	5	14	6	6	†
Imperial	971	634	240	123	76	43	626	445	†	†
Inyo	43	12	33	8	.	.	.	.	.	.
Kern	2084	893	1365	597	341	178	288	99	43	†
Kings	545	222	230	63	58	29	244	123	†	†
Lake	127	24	109	18	7	†	†	.	.	.
Lassen	52	13	49	12	†	.	.	.	.	.
Los Angeles	39687	17295	10790	2836	10867	4848	14409	8161	2784	1067
Madera	332	153	141	46	37	12	140	88	5	†
Marin	383	139	313	102	27	11	22	18	10	†
Mariposa	74	13	70	12	.	.	†	†	.	.
Mendocino	294	84	241	54	†	†	21	12	†	†
Merced	685	328	315	142	103	56	219	114	33	13
Modoc	24	5	22	†	.	.	†	†	.	.
Mono	16	10	12	7	.	.	†	†	.	.
Monterey	983	388	441	124	68	25	359	187	76	32
Napa	237	74	181	48	†	.	41	23	5	†
Nevada	150	28	139	27	†	.	9	†	.	.
Orange	6733	2534	4099	1119	296	133	1656	1020	504	194
Placer	434	128	379	100	8	†	27	13	13	7
Plumas	126	19	106	14	12	.	6	5	.	.
Riverside	5722	2672	3054	1148	927	532	1516	897	96	32
Sacramento	4164	1702	2234	740	1025	511	433	234	364	161
San Benito	87	35	41	14	†	†	42	18	†	†
San Bernardino	8976	4563	4091	1626	2109	1278	2353	1440	221	107
San Diego	7755	3107	3756	1059	1410	683	1693	951	639	261
San Francisco	3607	1176	1032	230	1099	325	487	287	901	286
San Joaquin	2038	808	1061	330	395	190	349	184	172	81
San Luis Obispo	510	166	401	108	27	17	61	35	6	†
San Mateo	1824	717	876	253	192	65	364	222	330	136
Santa Barbara	741	234	433	101	49	25	212	99	27	†
Santa Clara	4186	1449	1919	500	361	143	905	417	817	294
Santa Cruz	597	200	454	109	8	†	122	85	11	†

**Table 3: Number Asthma Hospitalizations by County and Race/Ethnicity for All Ages and for Children (0-14 years), 1995-1997, continued.**

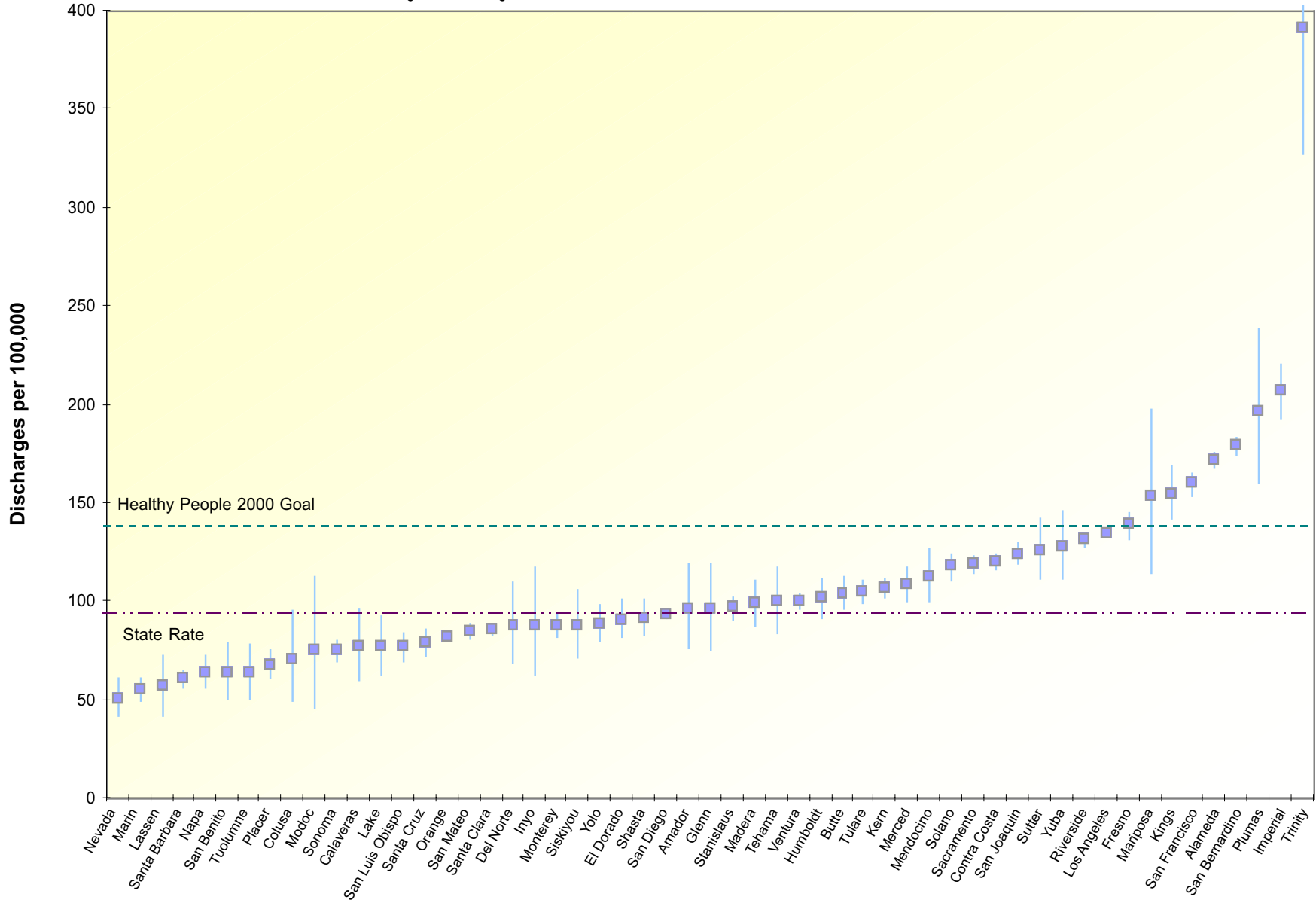
County	TOTAL		NON-HISPANIC WHITE		BLACK		HISPANIC		ASIAN/PACIFIC ISLANDER	
	All	Children	All	Children	All	Children	All	Children	All	Children
Shasta	440	141	413	131	13	8	†	.	†	.
Sierra	†	†	†	†	.	.	.	.	.	.
Siskiyou	123	36	116	33	.	.	†	.	†	†
Solano	1343	491	649	179	378	168	122	66	159	57
Sonoma	973	235	807	176	39	7	78	29	17	5
Stanislaus	1255	467	856	252	85	45	217	125	47	19
Sutter	294	97	199	58	22	10	26	16	26	6
Tehama	161	33	142	25	.	.	8	5	†	.
Trinity	144	8	138	8	.	.	†	.	.	.
Tulare	1151	444	618	183	59	24	412	218	37	12
Tuolumne	92	26	85	24	.	.	5	†	.	.
Ventura	2200	940	1221	374	127	79	732	427	80	32
Yolo	388	104	247	57	29	†	88	36	15	5
Yuba	242	92	191	64	17	8	12	8	17	8

† represents &lt;5 hospitalizations



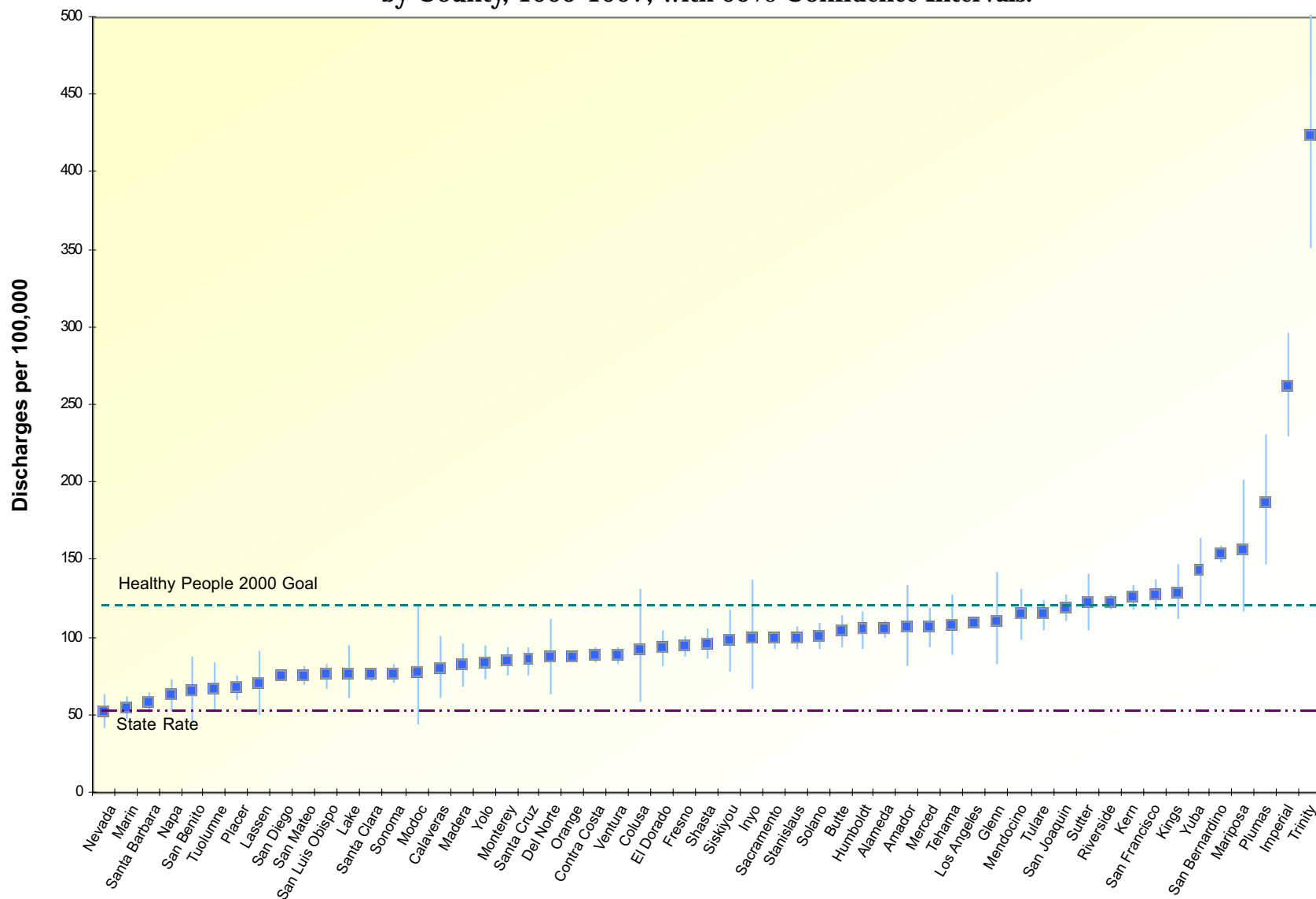
Figure 1: Age-Adjusted\* Asthma Hospital Discharge Rates for All Races Combined by County, 1995-1997, with 95% Confidence Intervals.

California Department of Health Services



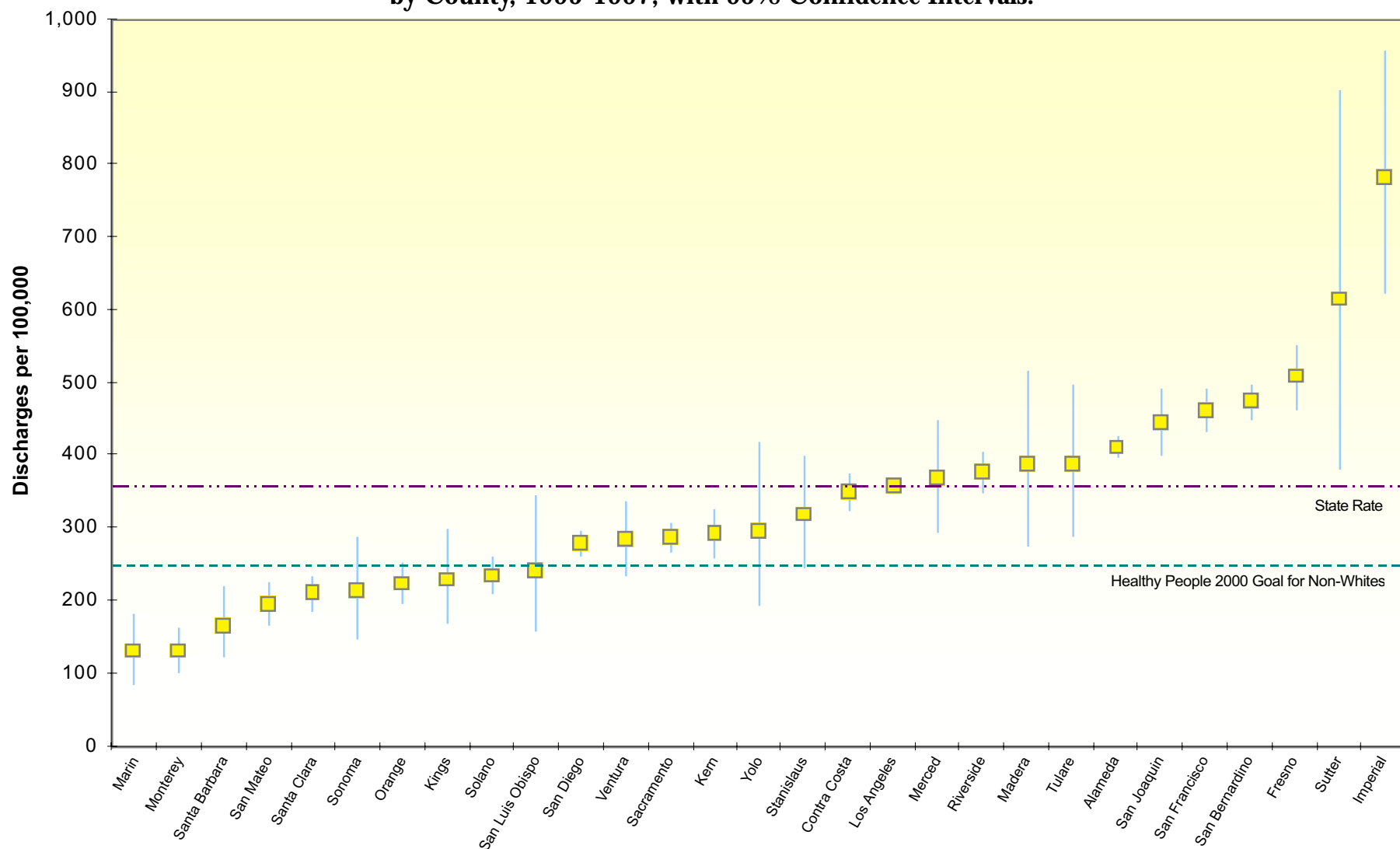
\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

**Figure 2: Age-Adjusted\* Asthma Hospital Discharge Rates for Non-Hispanic Whites by County, 1995-1997, with 95% Confidence Intervals.**



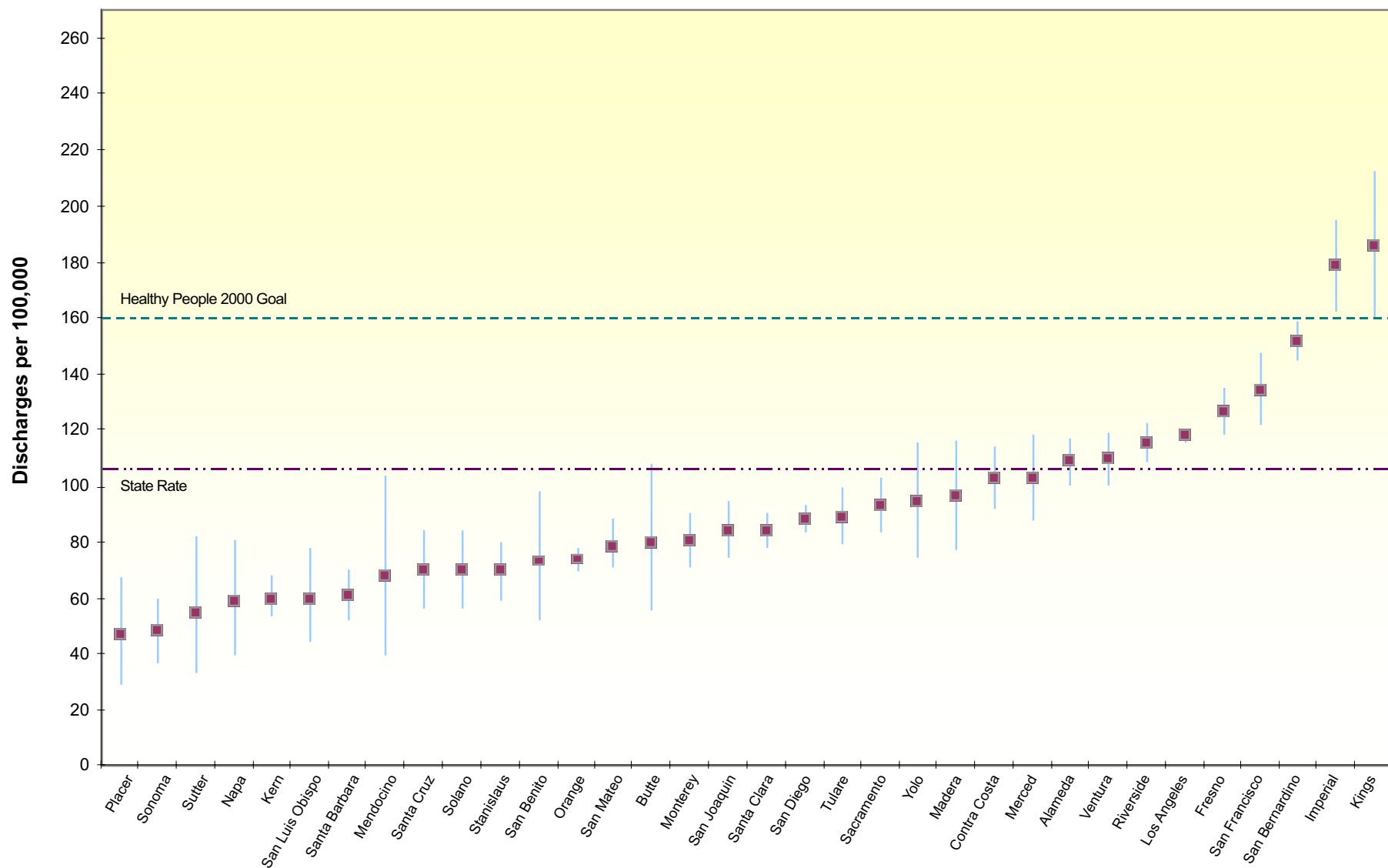
\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

**Figure 3: Age-Adjusted\* Asthma Hospital Discharge Rates for Blacks by County, 1995-1997, with 95% Confidence Intervals.**



\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

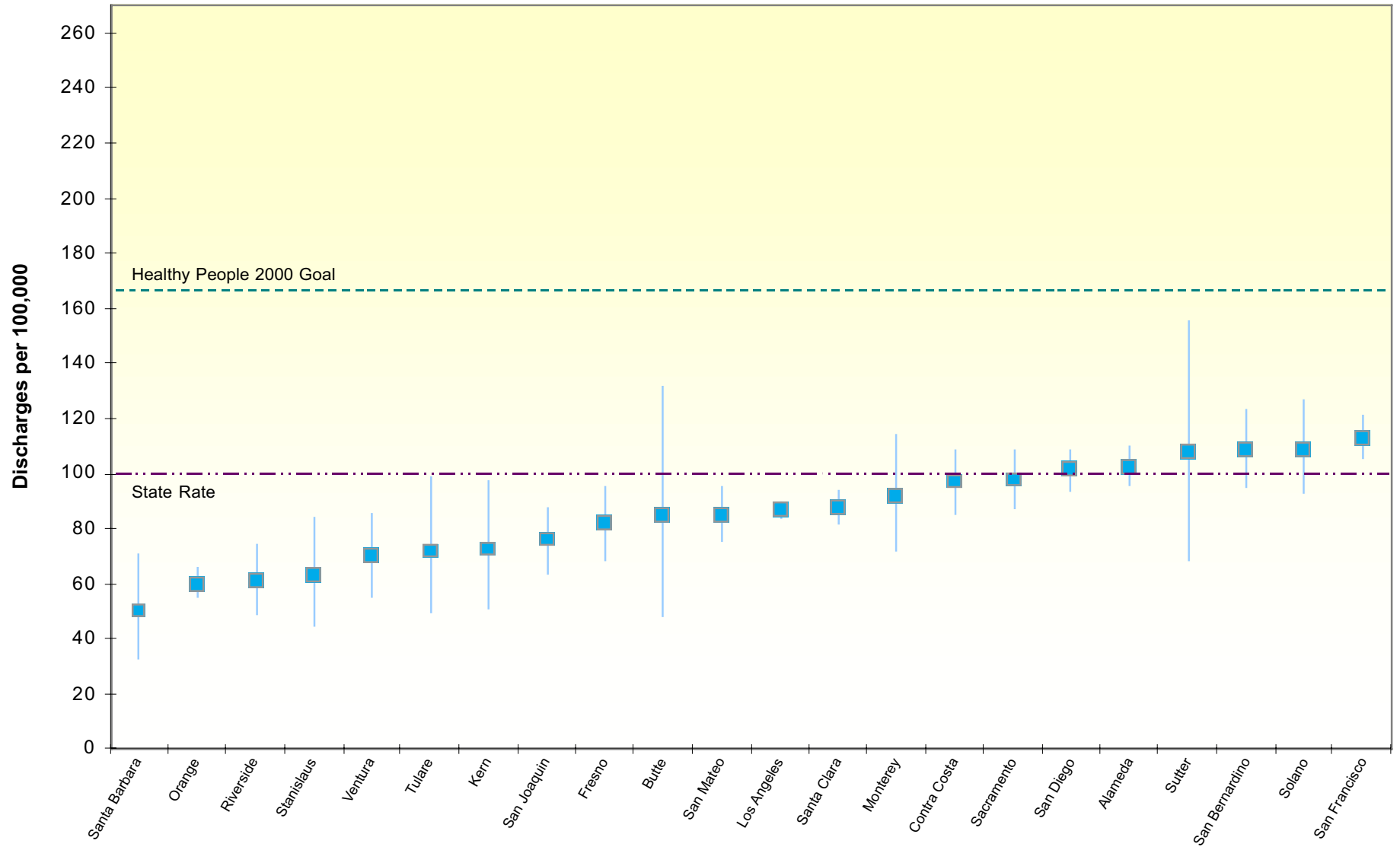
**Figure 4: Age-Adjusted\* Asthma Hospital Discharge Rates for Hispanics by County, 1995-1997, with 95% Confidence Intervals.**



\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

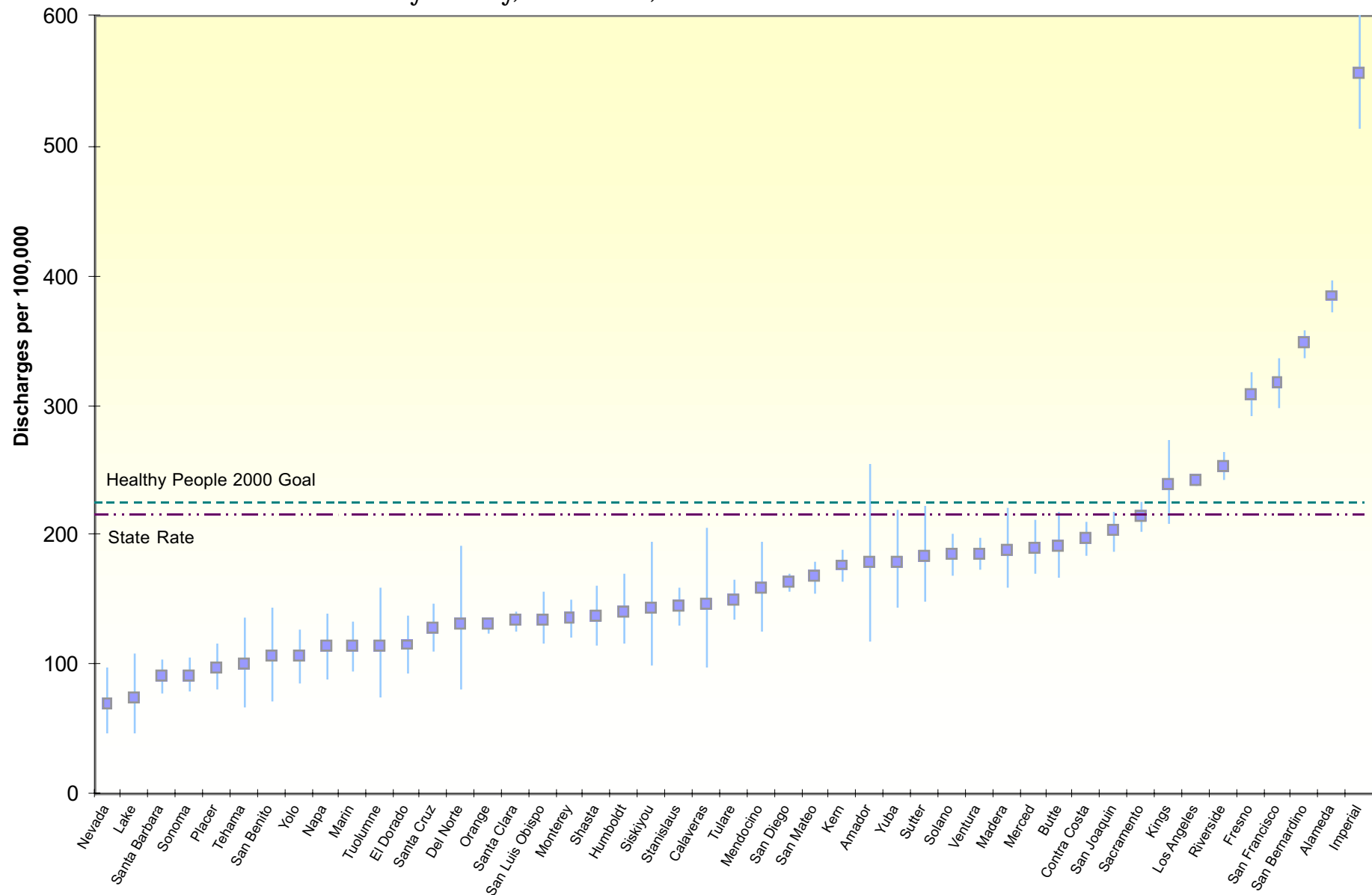


**Figure 5: Age-Adjusted\* Asthma Hospital Discharge Rates for Asian/Pacific Islanders by County, 1995-1997, with 95% Confidence Intervals.**



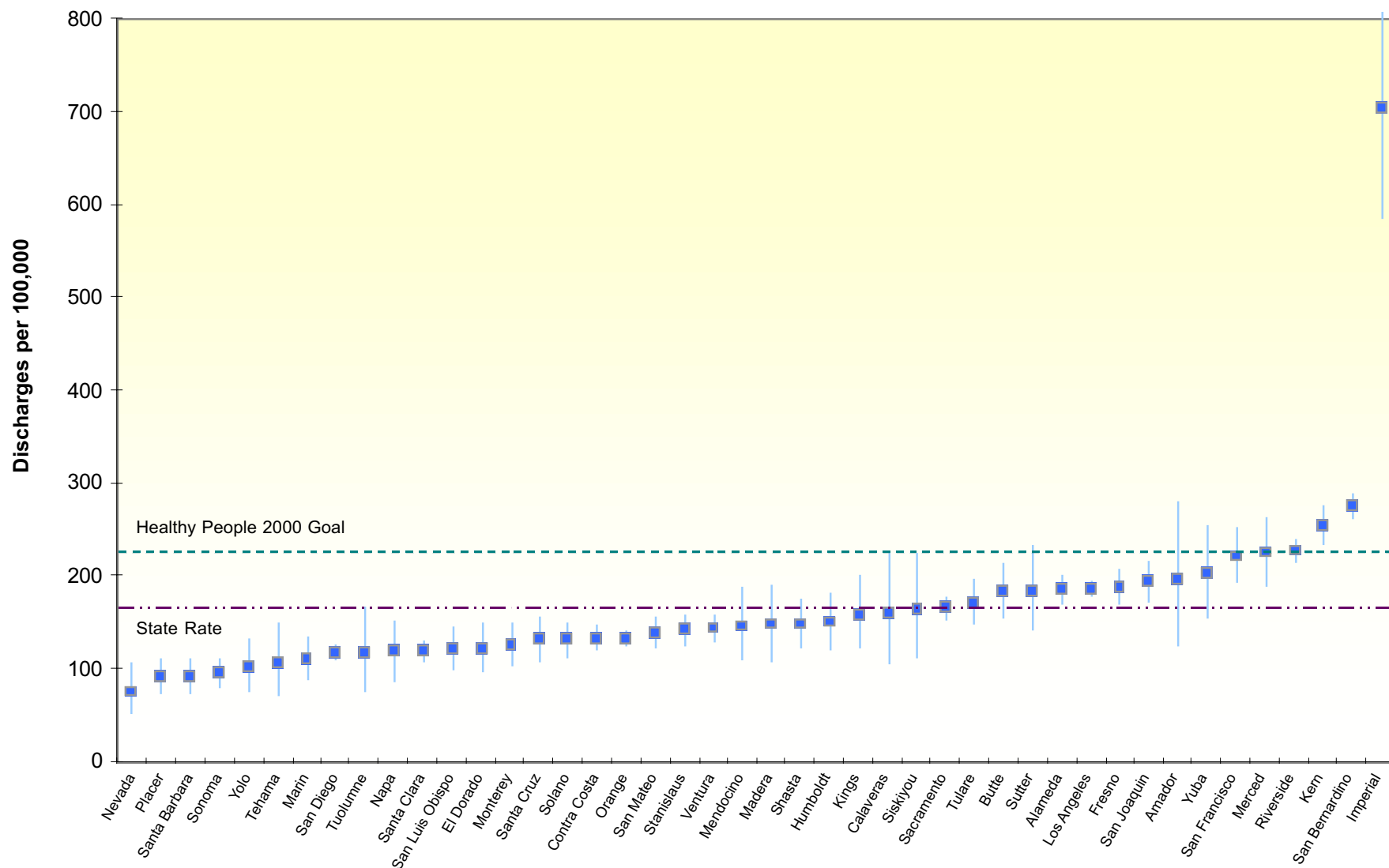
\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

**Figure 6: Age-Adjusted\* Asthma Hospital Discharge Rates for Children (Ages 0-14 years) for All Races Combined, by County, 1995-1997, with 95% Confidence Intervals.**



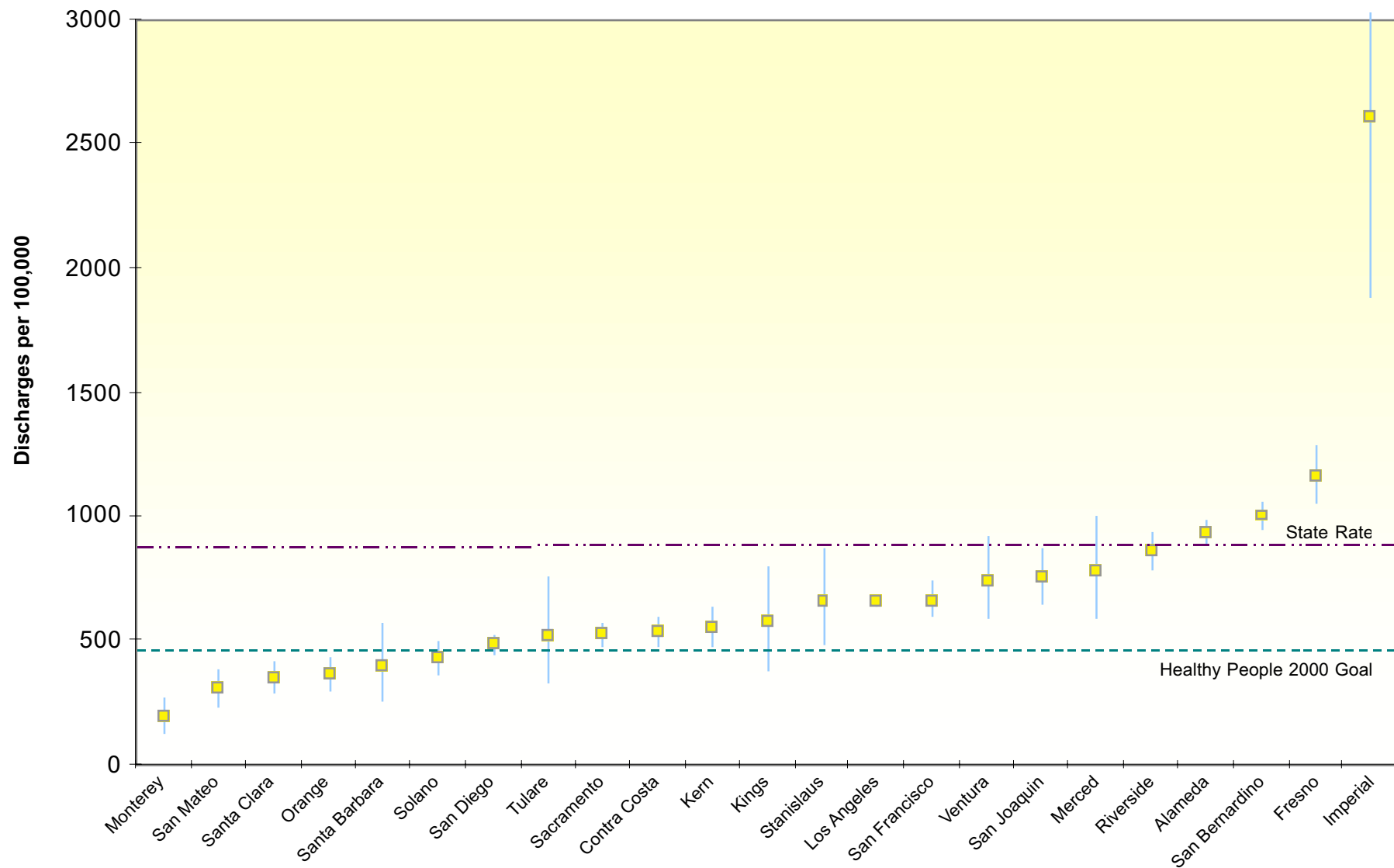
\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

**Figure 7: Age-Adjusted\* Asthma Hospital Discharge Rates for Non-Hispanic White Children (Ages 0-14 years) by County, 1995-1997, with 95% Confidence Intervals.**



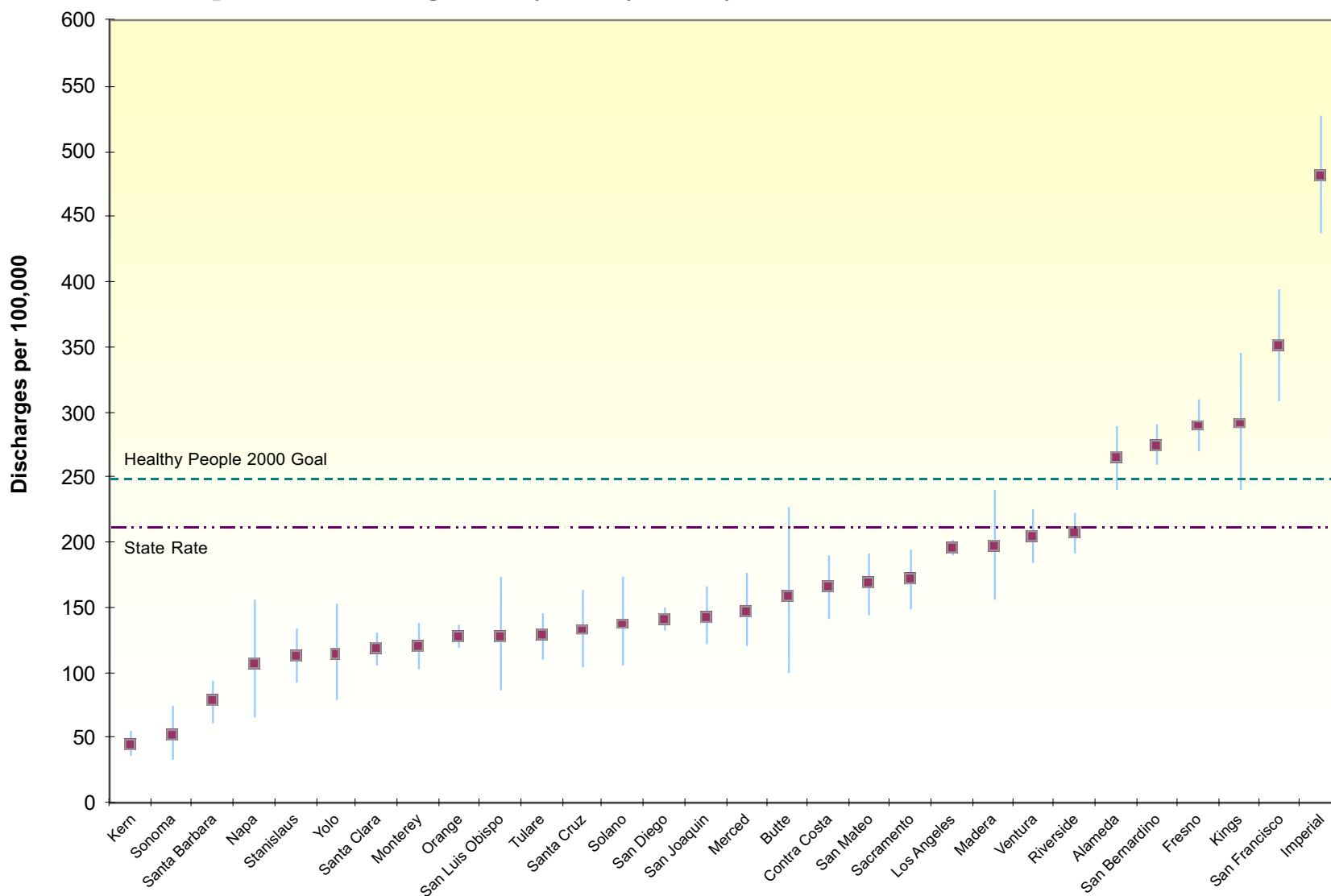
\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

**Figure 8: Age-Adjusted\* Asthma Hospital Discharge Rates for Black Children (Ages 0-14 years) by County, 1995-1997, with 95% Confidence Intervals.**



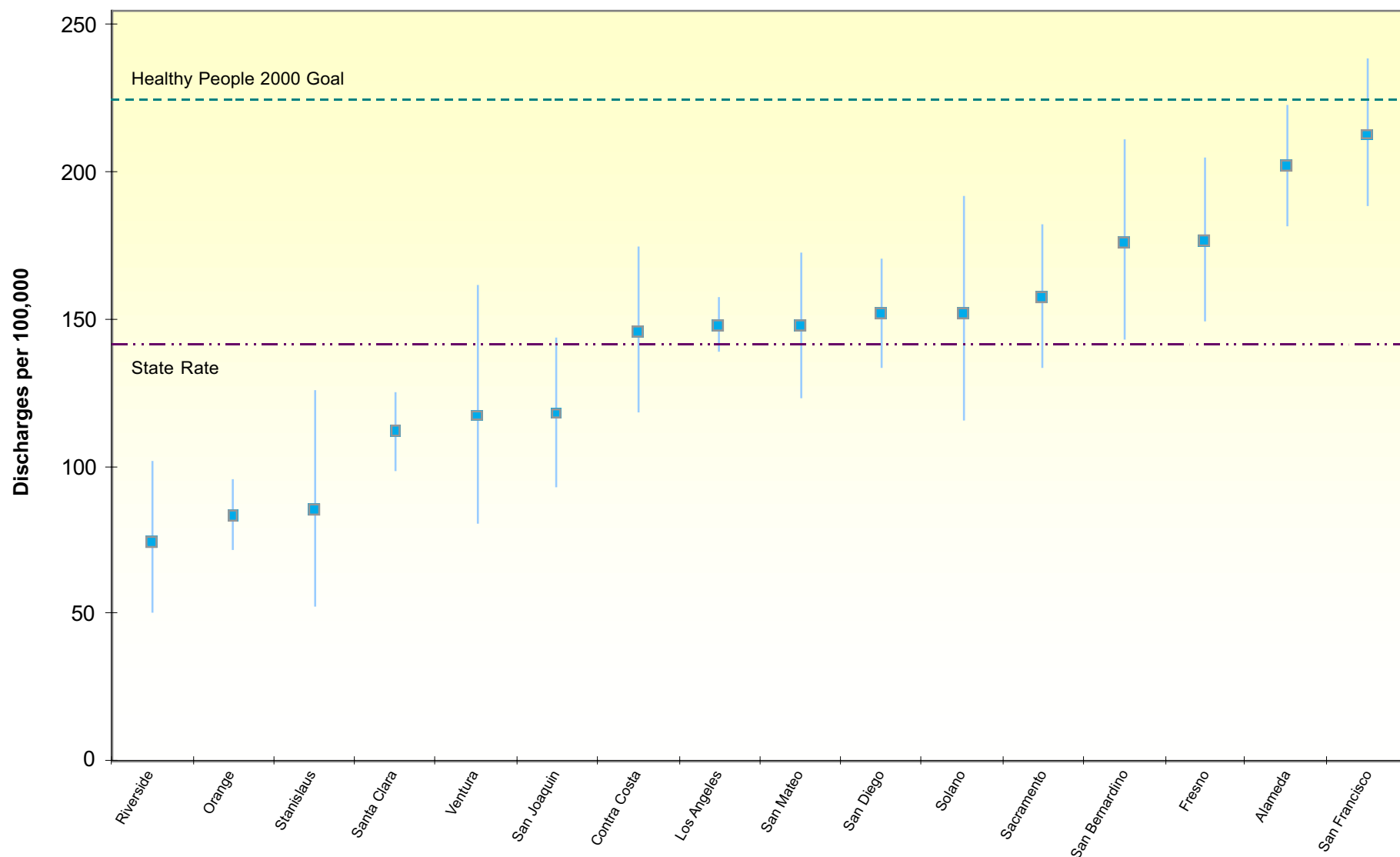
\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

**Figure 9: Age-Adjusted\* Asthma Hospital Discharge Rates for Hispanic Children (Ages 0-14 years) by County, 1995-1997, with 95% Confidence Intervals.**



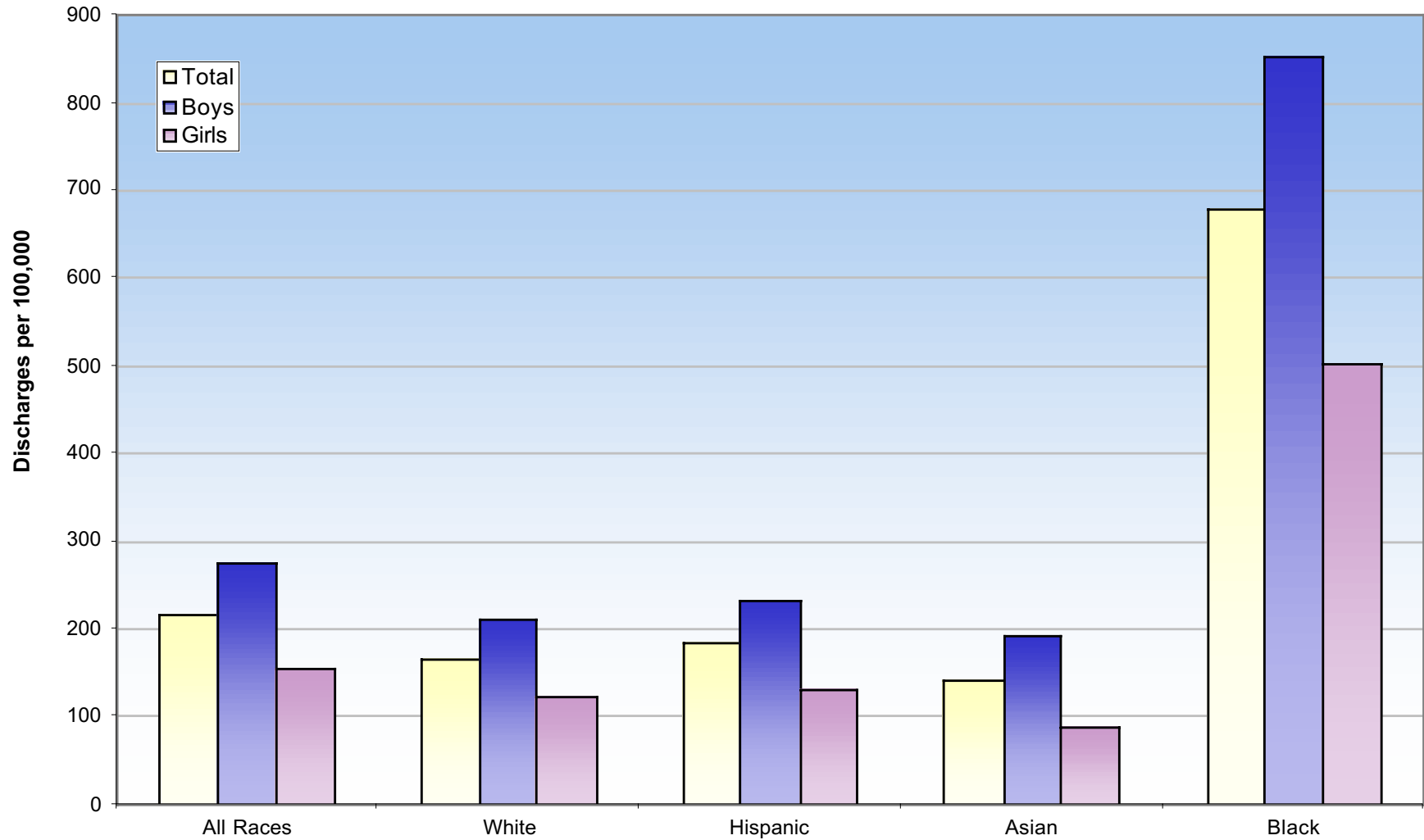
\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

**Figure 10: Age-Adjusted\* Asthma Hospital Discharge Rates for Asian/Pacific Islander Children (Ages 0-14 years) by County, 1995-1997, with 95% Confidence Intervals.**

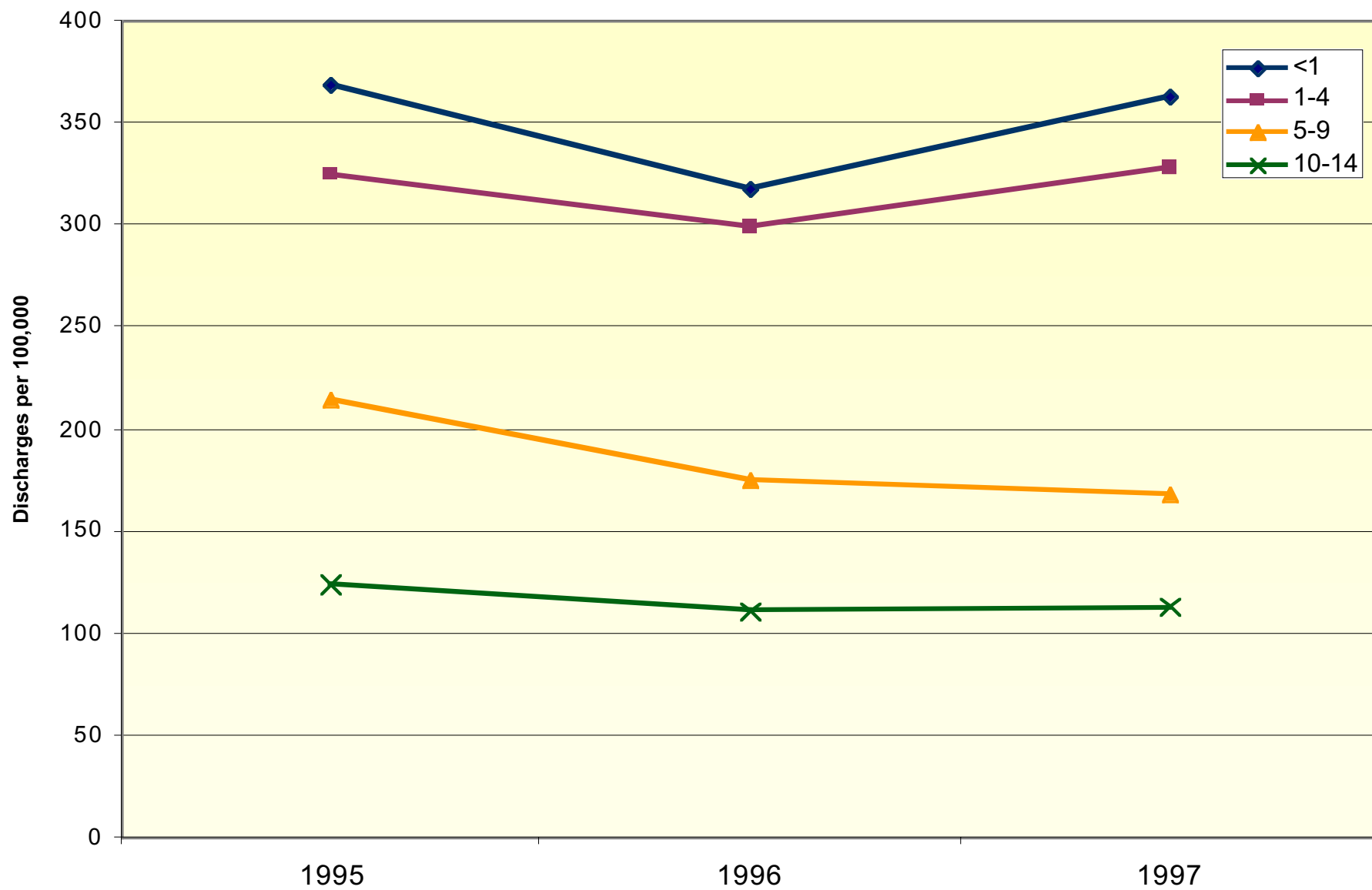


\*Age-adjusted to the 1990 California population. Counties with less than 20 cases not shown.

**Figure 11: Age-Adjusted\* Asthma Hospital Discharge Rates for Children (Ages 0-14 years) by Race and Sex, 1995-1997.**

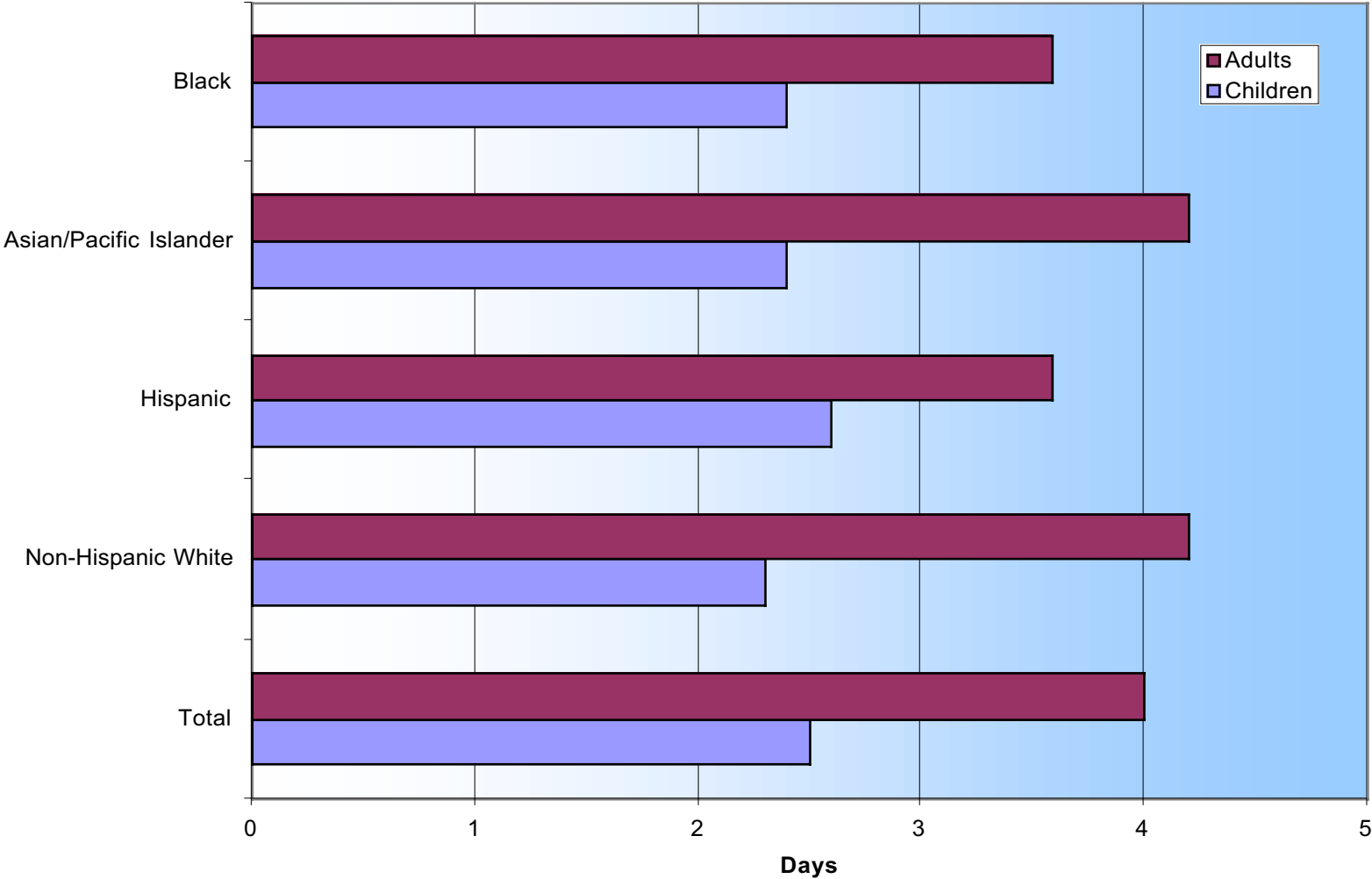


\* Age-adjusted to the 1990 California population.

**Figure 12: Asthma Hospital Discharge Rates for Children by Age Group, 1995-1997.**



**Figure 13: Mean Length of Stay in Days for Hospital Admission from Asthma for Adults (>14 years) and for Children (Ages 0-14 years) by Race/Ethnicity.**



**Figure 14: Mean Total Charges Incurred from Hospital Admission from Asthma for Adults (>14 years) and for Children (Ages 0-14 years) by Race/Ethnicity.**

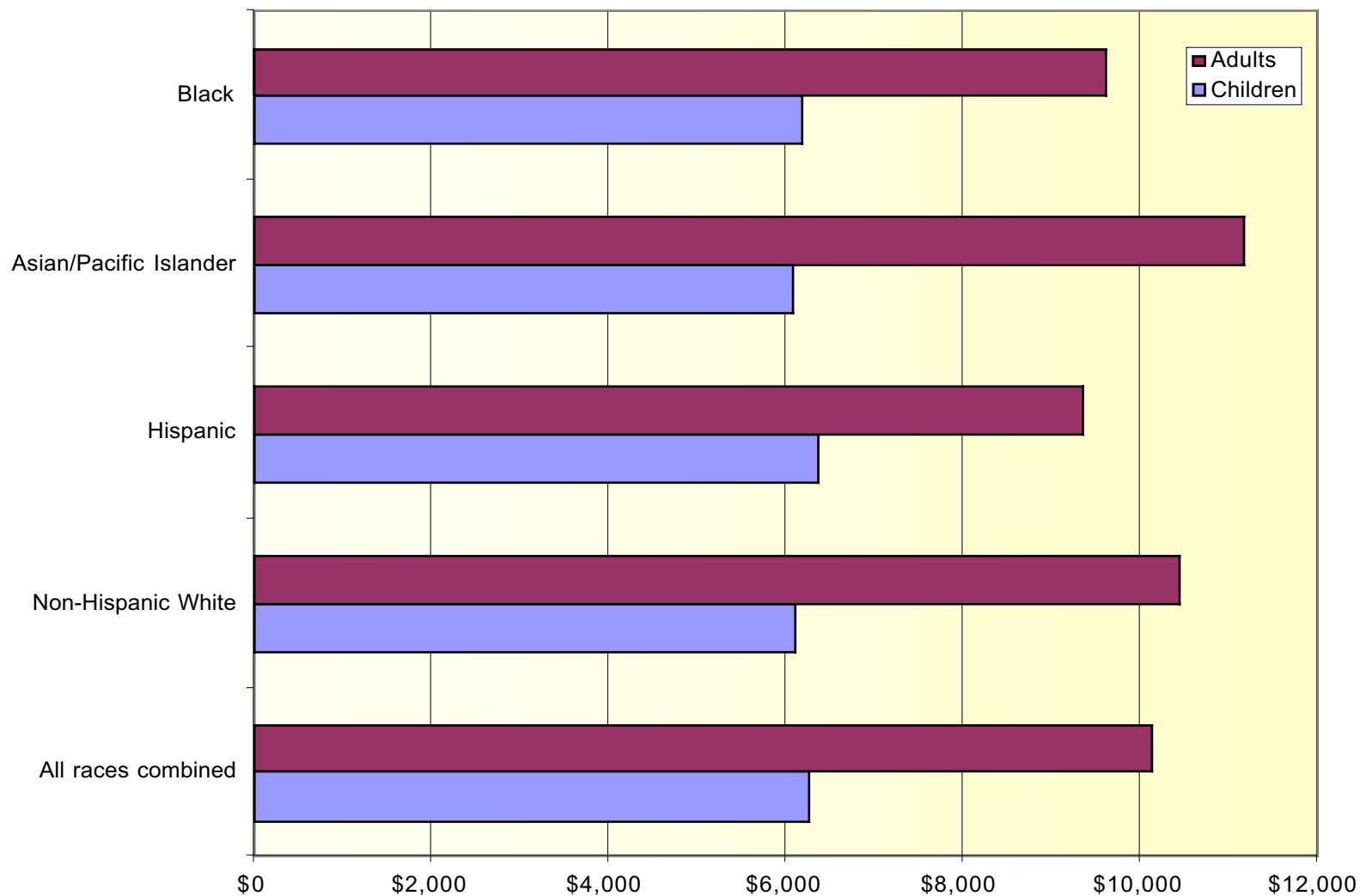
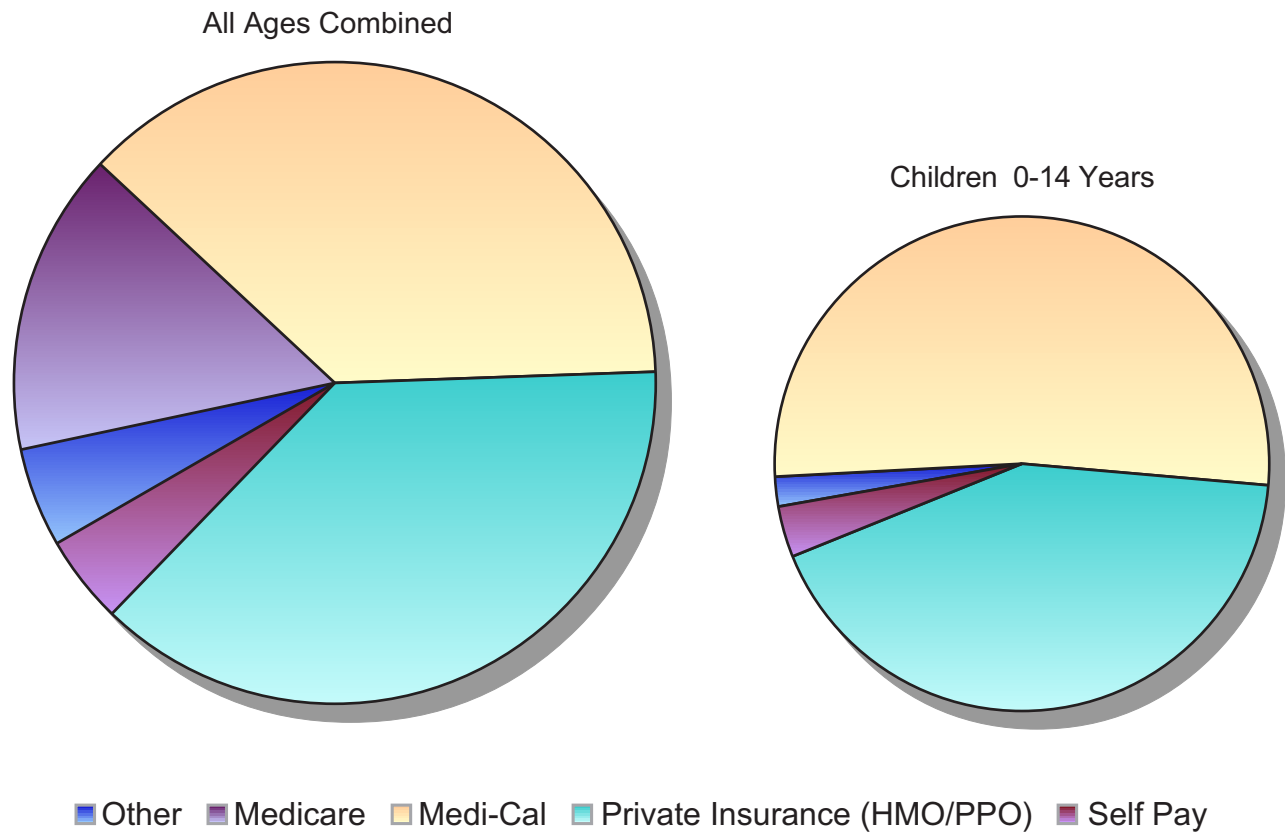
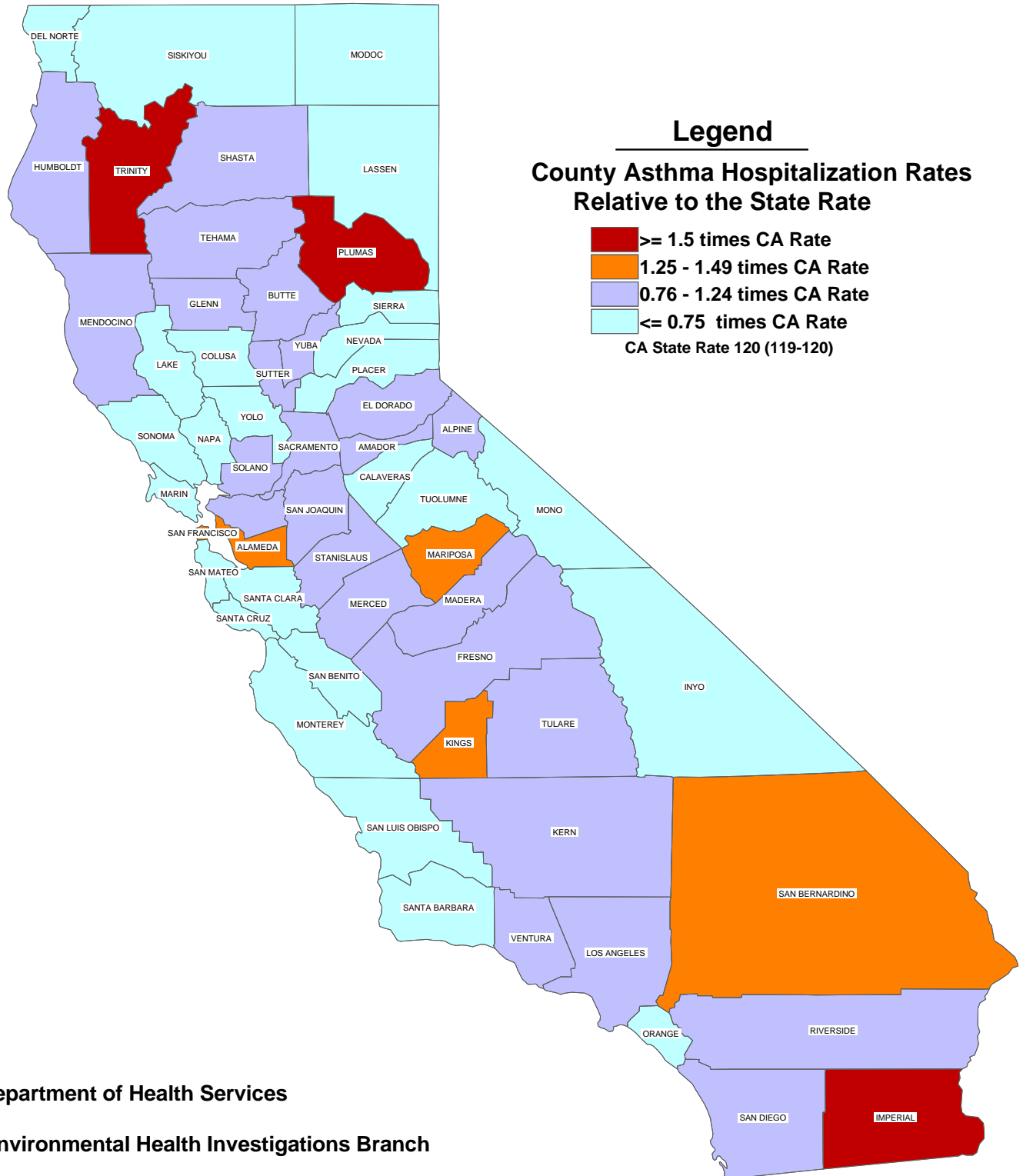


Figure 15: Expected Source of Payment for Hospital Admission from Asthma for All Ages and for Children (Ages 0-14 years).





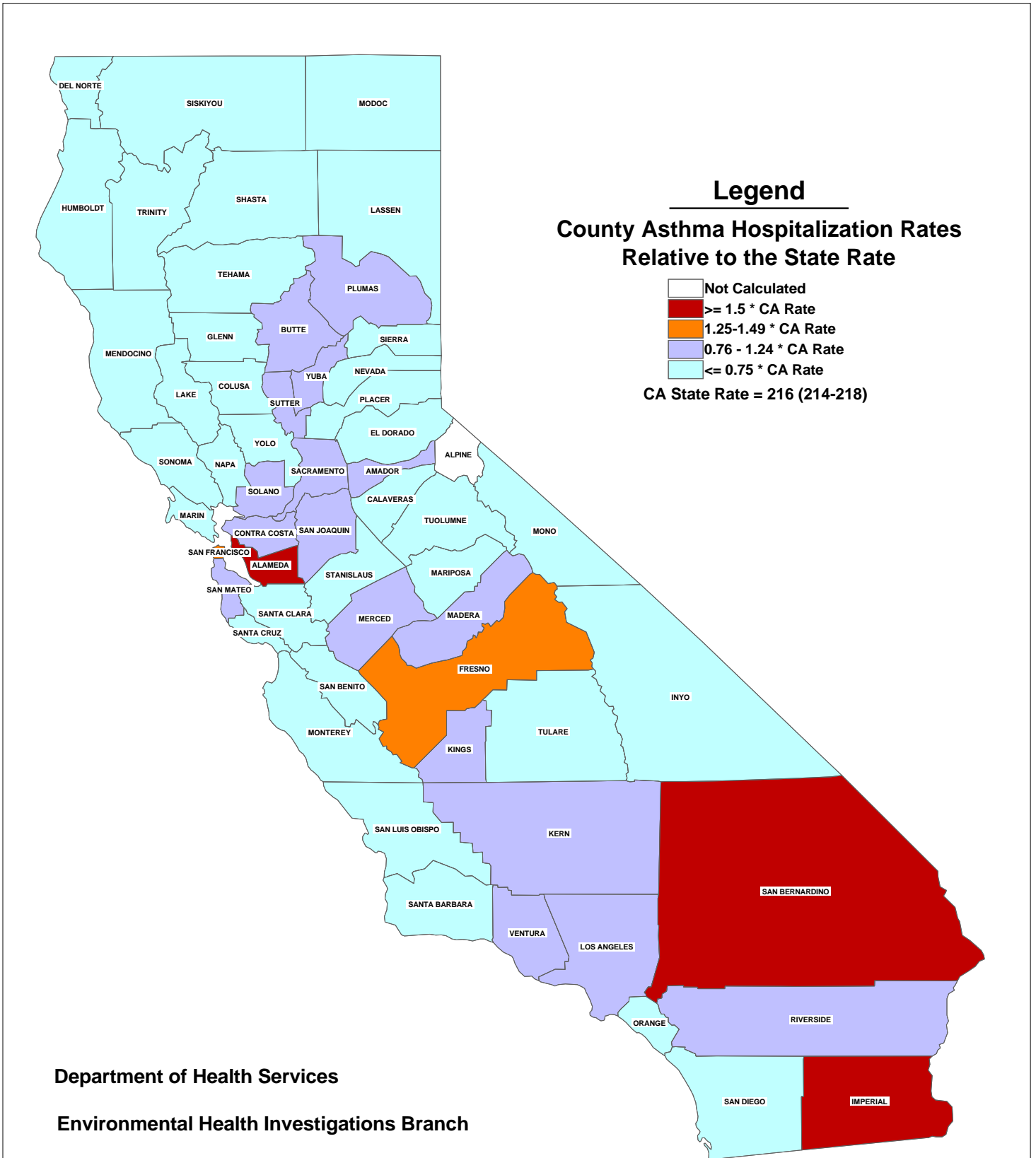
**Map 1: Age-Adjusted\* Asthma Hospitalization Rates\*\*.**  
**County Rates Relative to State Rate.**  
**All Ages and All Race/Ethnicity Groups Combined.**



\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures

**Map 2: Age-Adjusted\* Asthma Hospitalization Rates\*\***  
**County Rates Relative to State Rate.**  
**For Children All Race/Ethnicity Groups Combined.**

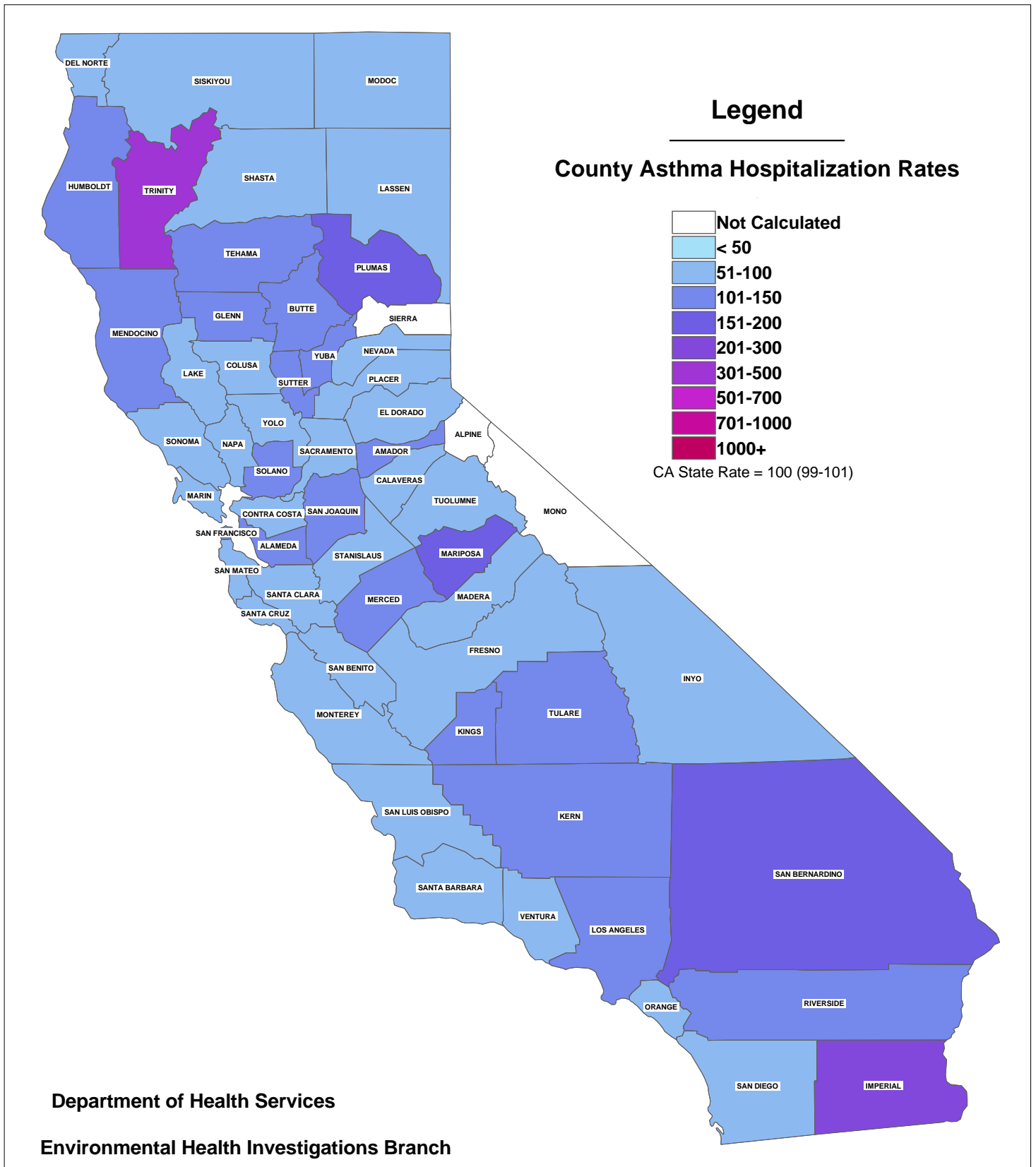


\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures

# Map 3: Age-Adjusted\* Asthma Hospitalization Rates\*\*, 1995-1997.

## Non-Hispanic Whites (All Ages)

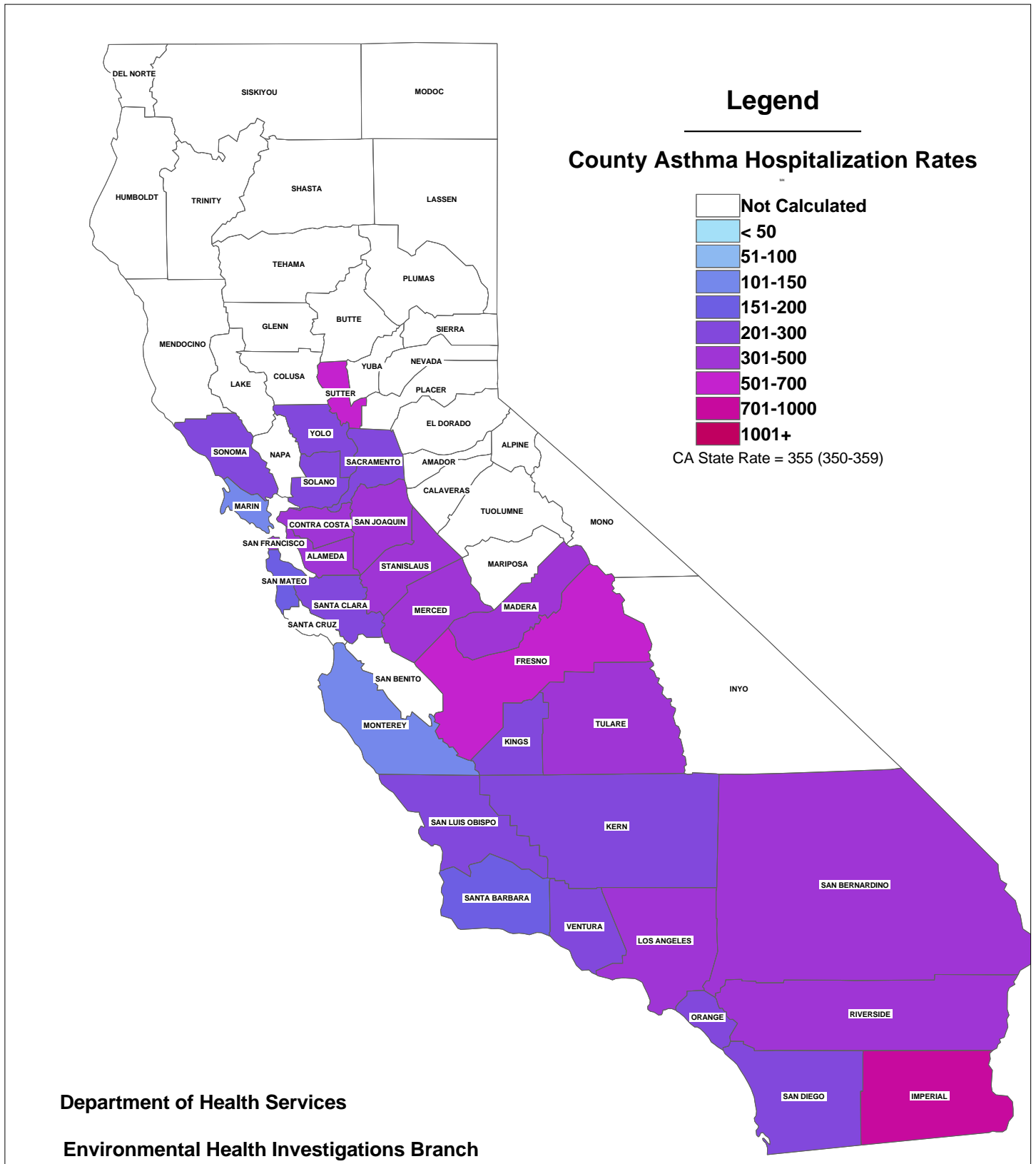


\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures

# Map 4: Age-Adjusted\* Asthma Hospitalization Rates\*\*, 1995-1997.

Blacks (All Ages).



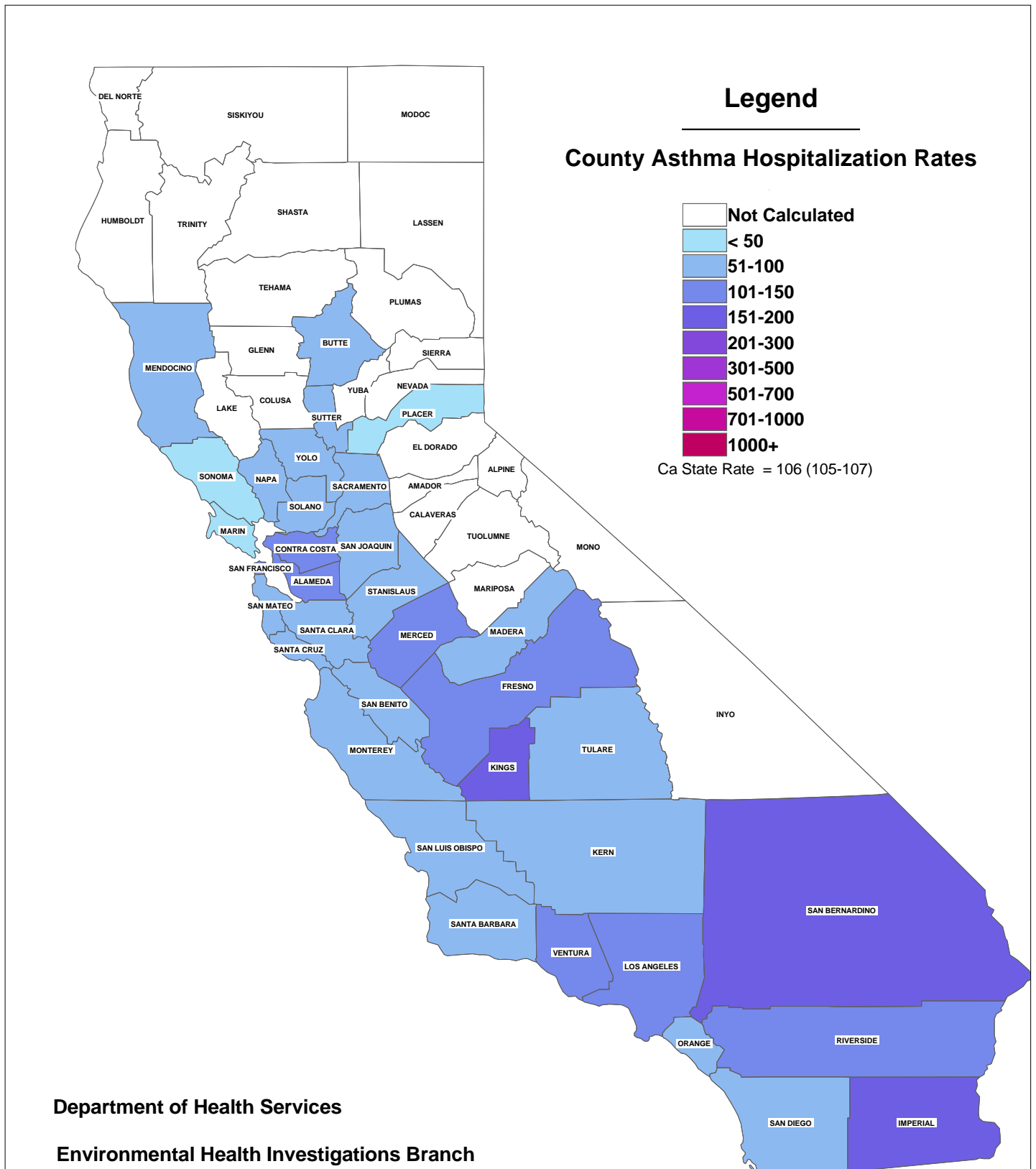
\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures



# Map 5: Age-Adjusted\* Asthma Hospitalization Rates\*\*, 1995-1997.

Hispanics (All Ages).

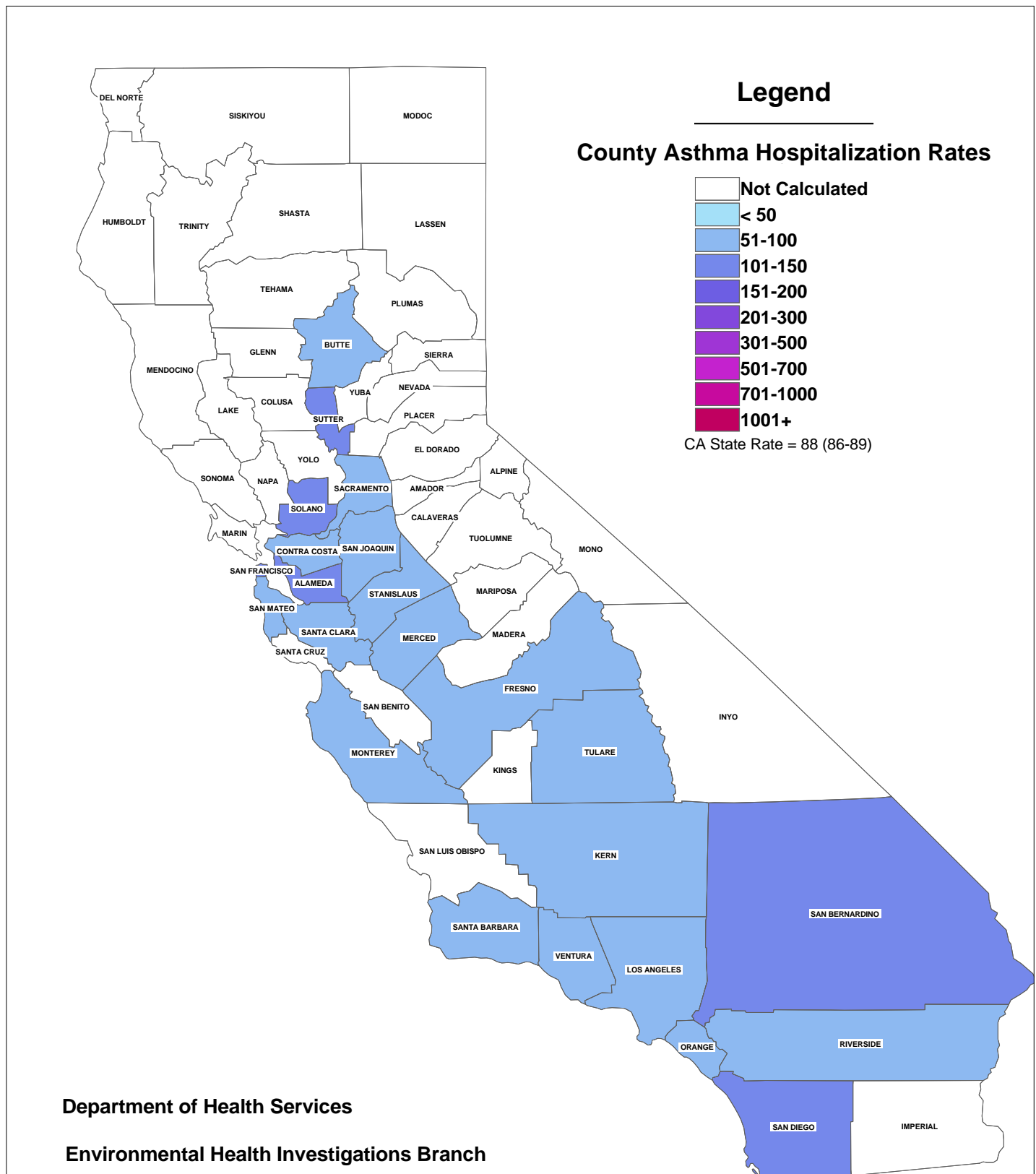


\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures

# Map 6: Age-Adjusted\* Asthma Hospitalization Rates\*\*, 1995-1997.

Asian/Pacific Islanders (All Ages).

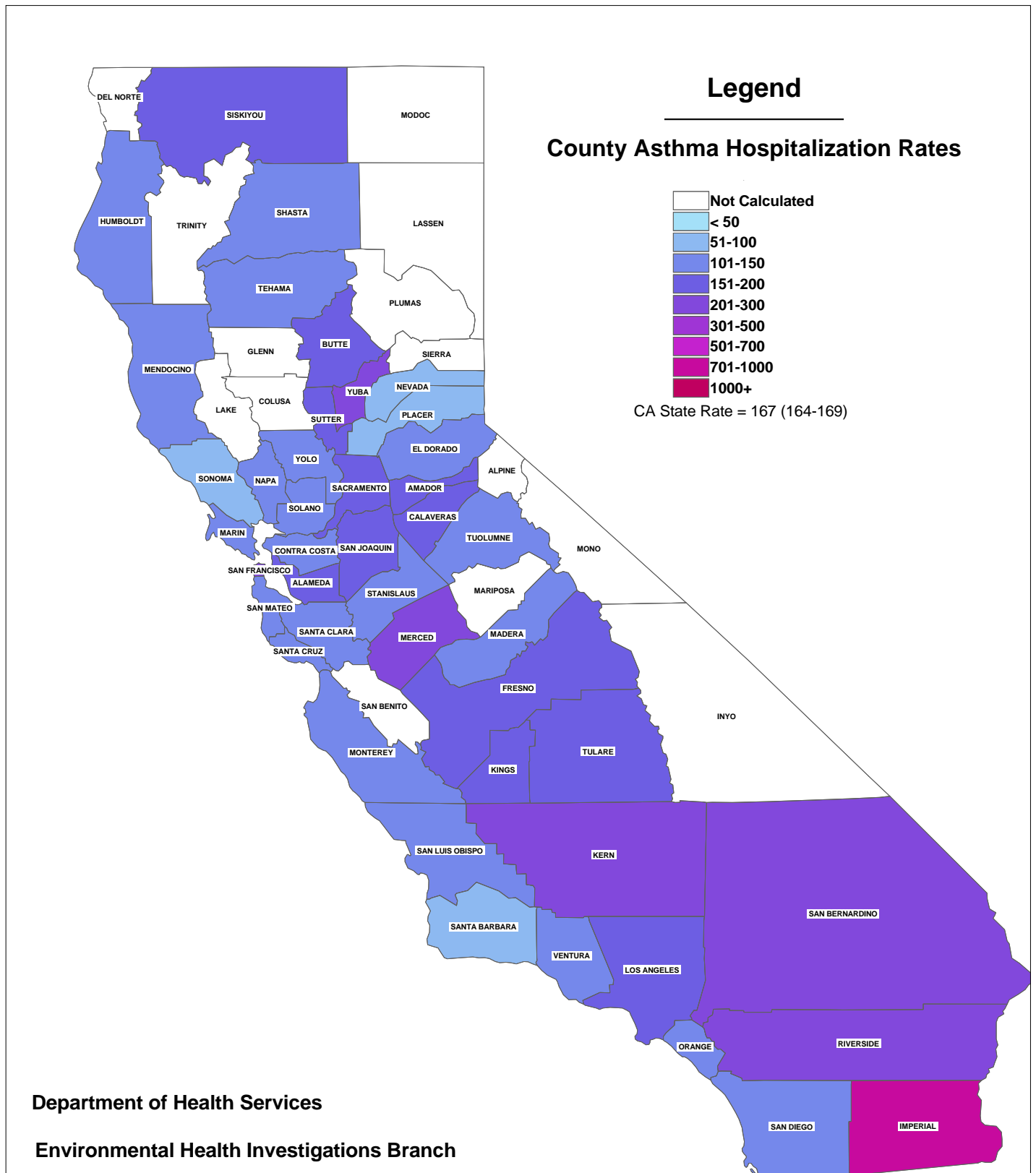


\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures

# Map 7: Age-Adjusted\* Asthma Hospitalization Rates\*\*, 1995-1997.

Non-Hispanic White Children.

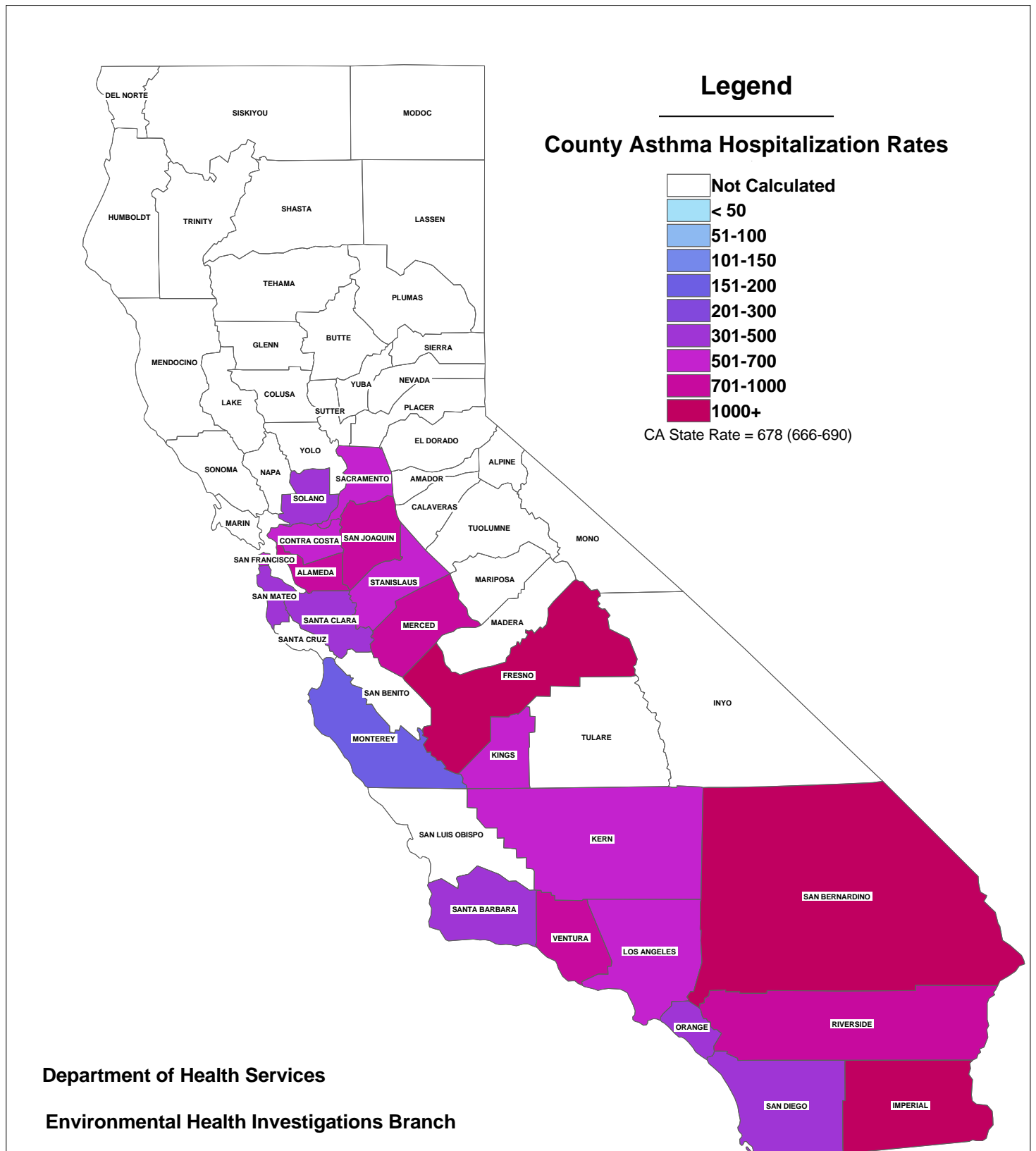


\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures

# Map 8: Age-Adjusted\* Asthma Hospitalization Rates\*\*, 1995-1997.

Black Children.

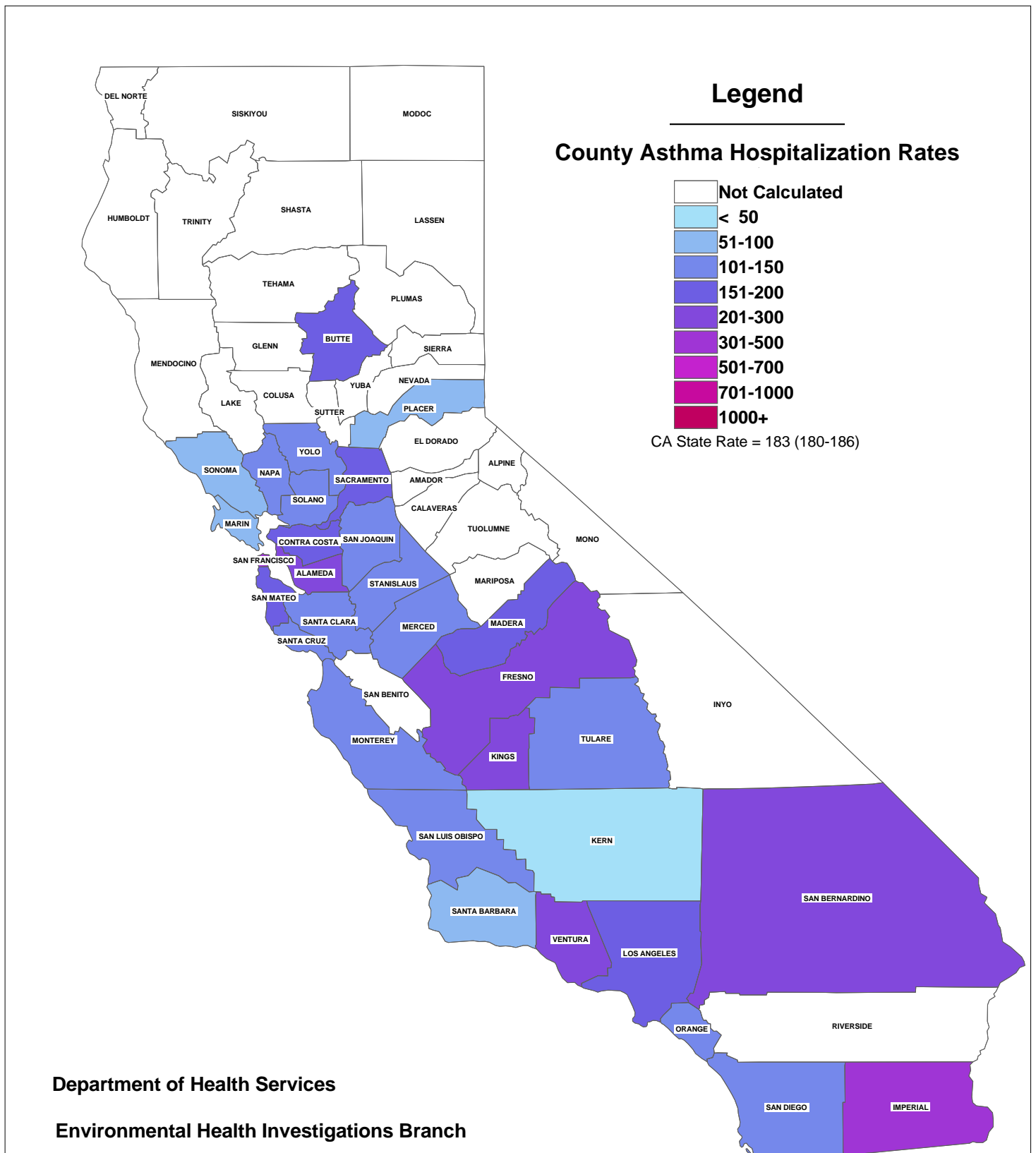


\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures

# Map 9: Age-Adjusted\* Asthma Hospitalization Rates\*\*, 1995-1997.

Hispanic Children.

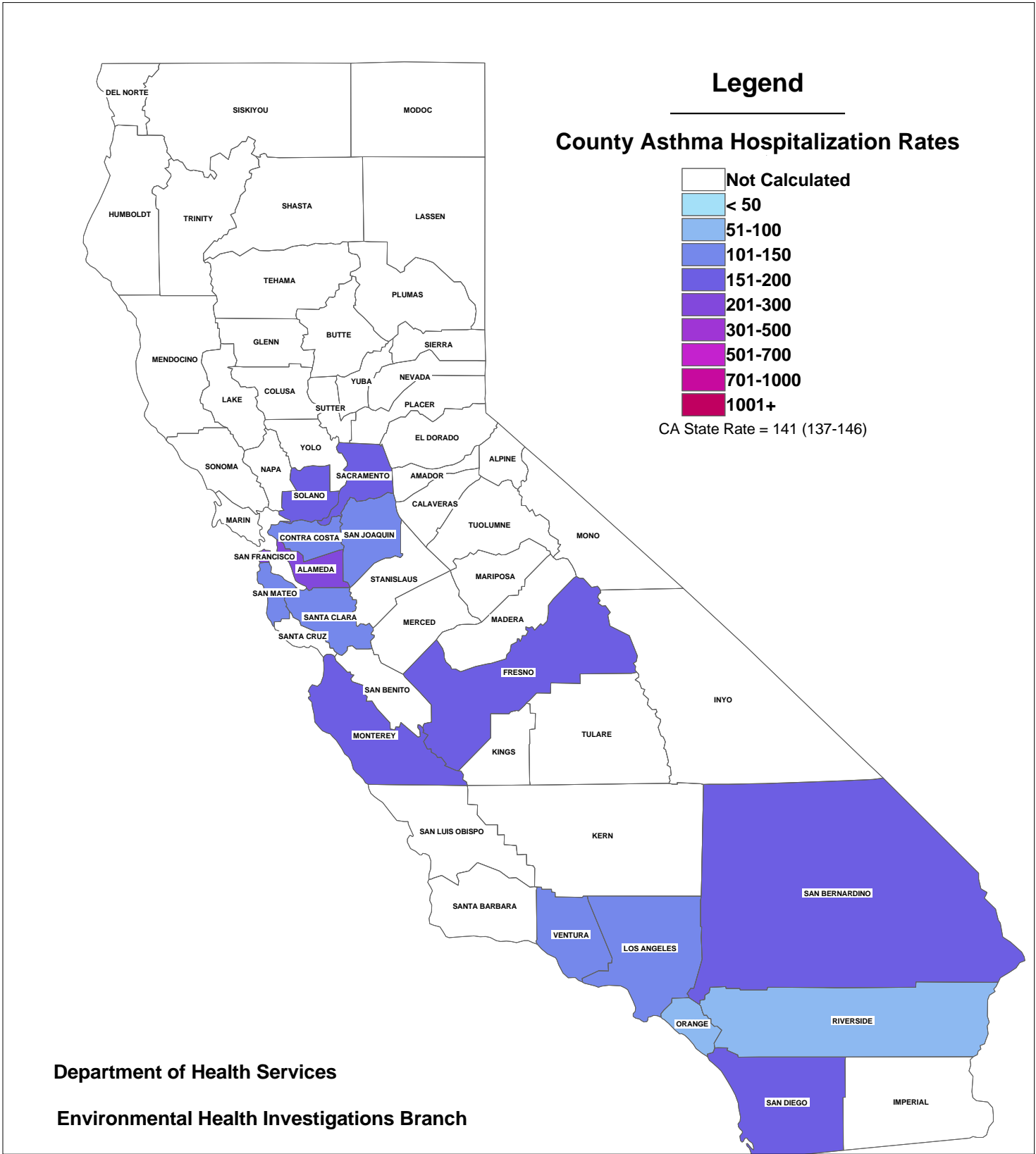


\*Age-Adjusted to The California 1990 Population

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures

**Map 10: Age-Adjusted\* Asthma Hospitalization Rates\*\*, 1995-1997.**

**Asian/Pacific Islander Children.**



\*Age-Adjusted to The California 1990 Population  
40

\*\*For Statistical Significance of Individual Rates Please See Tables or Figures